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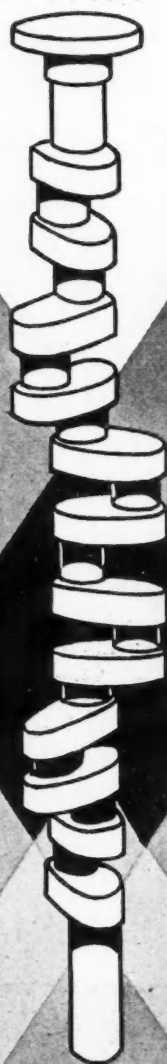


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AUTOMOTIVE INDUSTRIES

VOLUME 61

Philadelphia, Saturday, November 9, 1929

NUMBER 19

Motor Industry Is Proved Sound By Wall Street Crashes

*Representative bankers of the country maintain in hours of stress
that stability of automobile makers is unquestionable.
Continued prosperity depends on dealer relations.*

By EARL O. EWAN

TRIED by the ordeal of the greatest crash in the history of the stock market, the automobile industry proved sound. Representative Wall Street bank officials unanimously and unequivocally said so when approached within 48 hours after the trading debacle of Oct. 29. The stress and strain of the trying days that began with the first astounding collapse on Oct. 24 did not lessen their faith in the manufacturers of motor vehicles. Here are certain of the reasons they gave for their positiveness:

Cash balance figures.

Earnings statistics.

Recent curtailment of production.

Small inventories of manufacturers.

Solvency of industry generally in the United States.

Qualifying phrases were not found necessary by these leaders in American finance in speaking of the millions of "cash-in-hand" credited to automobile makers. The earnings figures could not be translated into a code of doubt.

From the production angle, the disaster was timely. Output rates had been curtailed with an increasing rapidity that had become almost abrupt. A few plants had closed for inventory, and others were planning to do so shortly. Activity was almost at a minimum in organizations where preparations were

under way for turning out new models. Part-time working systems had been instituted in several instances to keep all of the employees on the payroll.

Had the market slump occurred in February or March of this year, or any year, the position of the automobile industry probably would have been more embarrassing. At that season, the industry is gathering momentum

in its production. Inventories are high. Dealer stocks are very heavy. Instead of coming then, however, the break occurred after the industry had established all-time production and sales records.

Comparatively little probably will be done in the remainder of 1929 in the way of production other than to prepare for the 1930 automobile shows, beginning with the New York Exposition in January, except in the case of Ford and Chevrolet. It had been rumored persistently before the precipitation of the market that those two manufacturers would close for model

changes before the end of the year. Both had reduced their production schedules.

Even with the opening of 1930, the bankers consulted doubted if the manufacturers would resume production on a large scale until a tangible estimate of the market demand had been ob-

COMMENTING upon the stock market situation as he arrived in New York last week from abroad, Alfred P. Sloan, Jr., President of General Motors, said:

"I don't understand this market situation. I cannot see any logical reason for any such action as has occurred with present market values. Business is sound. Certainly it has been so with General Motors.

"Frankly, the automobile business in Europe is good. I speak particularly of the business in Germany, and the outlook in other countries on the Continent and in England is bright over a long period. I look forward with confidence to what General Motors will accomplish next year.

"Any change in the public attitude toward industrial stocks and shares will affect the automobile business less than any other industry, because the motor car is so generally recognized as a business necessity. It has long ago been removed from the classification of a luxury."



tained. Most of them even went so far as to say that one favorable result of the market catastrophe for the industry might be the inauguration of regulated production, or flexible production schedules, such as have been advocated recently by L. A. Miller, president of Willys-Overland, and R. H. Scott, president of Reo.

Adoption of such a program should at least protect the industry from charges of over-production, which now seem justified on the basis of distributor and dealer inventories. One such charge was made in *The Annalist* of Oct. 25 in these words: "It is evident now that the industry in the first nine months of the year turned out a serious excess of cars, and that it is suffering from the retail indigestion logically consequent to such an indiscretion."

The market disaster, however, did not stop rumors and reports in the industry. Between the trying market days of Oct. 24 and 29, an internationally known automobile executive returned from abroad and was reported to have told his bankers that his company could put into production upon short notice a 16-cylinder engine for a front-wheel-drive stock car. He was said to have been accompanied on his homeward voyage by one of the pioneers of the industry, who bought extensively of several automotive stocks in the steamer's brokerage office immediately after the crash of Oct. 24.

Another source reported that one of the most prominent executives in the industry had said his company was experimenting with a front-wheel-drive car and an automatic transmission. If these reports be true, the automobile market of 1930 may be stimulated by the quickened obsolescence of the vehicles in use. Such developments, of course, would further complicate the already serious problem of selling new and used cars.

Meantime, while there is little production, dealers will have an opportunity to clear their floors of new and used car stocks. Accumulation of the latter had reached an acute stage in many localities as a result of fall trade-ins on new cars. This condition may be relieved somewhat, however, by those who need automobiles but find that their purchasing power has been reduced by financial losses. Dealers who will show the best results in used car sales probably will be those whose factories have special used car departments, such as are maintained by Oakland, Chrysler, including Dodge, De Soto and Plymouth; Graham-Paige, Buick and Hudson, or whose factories give them advisory assistance, as do Studebaker, Oldsmobile and Ford.

This is important, because largely on the continued success of their dealers will depend the stability of the manufacturers. To be sure, the latter have been tried and found financially sound, but whether or not they retain that status depends largely on how successfully their dealers bear the brunt of the collapse that has fallen upon them when their floors are filled with new and used cars which must be sold soon. Wall Street is aware of that factor, it was learned from the bankers interviewed, and probably will look upon reports of harmonious relations between manufacturer and dealer

as one of the favorable indices for the continued success of the maker.

This relationship doubtless will be tried severely in these closing months of 1929, as dealers exert increased effort to lower their heavy stocks against the unusual sales resistance that has been set up by the stock market panic. Another factor in the car market will be the increased competition from Ford created by the reduction in prices on all of the Ford models, ranging from \$15 to \$200, which was announced Nov. 1. Ford prices, however, still are above those at which the Model A series originally was announced. A tabulation of these price changes is shown on page 706.

The price cut should help to retain this high sales average that has been scored thus far this year by cars in the lower price classes. It will be recalled that in the first eight months of this year cars priced at \$750 and under, wholesale, composed 81.7 per cent of the sales volume of the industry as compared with 73.2 per cent registered for the same category in the identical period of 1928. Cars priced at from \$751 to \$1,000 had only 8.3 per cent of the total volume this year as against 11.8 per cent in 1928 for the first eight months. These two classes in that period were responsible for 90 per cent of the volume in 1929 as compared with 85 per cent last year. Cars priced at \$1,001 to \$1,500 accounted for 7.1 per cent of the entire sales volume in the first eight months this year as against 10.9 per cent in that

period last year, while automobiles selling at from \$1,501 upward, wholesale, took 2.9 per cent of the sales volume up to Aug. 31, 1929, as against 4.1 per cent up to and including that date in 1928.

Sales reports

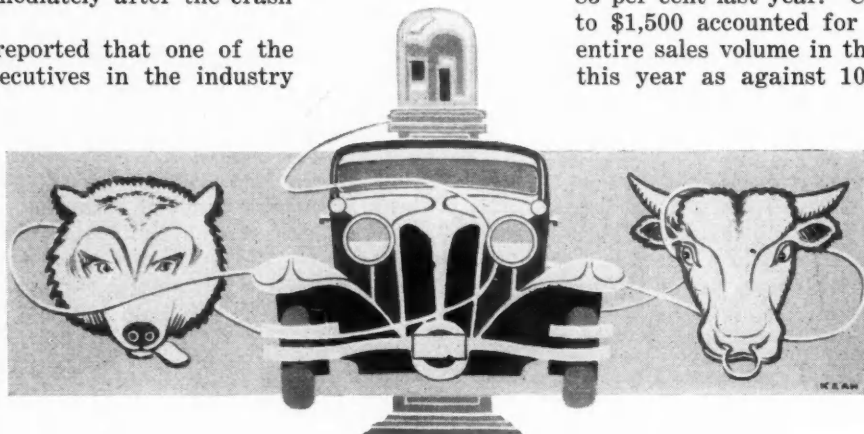
for October from fourteen of the outstanding centers of the country indicated that dealer business up to the eve of the market crash of Oct. 29 had been favorable for the fall season, with Ford and Chevrolet leading the field.

Car stocks in most localities, however, were far too heavy for comfort. The changed financial status, however, makes it impossible to base any sales forecast upon data compiled up to Oct. 29. Following are summaries of the reports, which were prepared especially for *Automotive Industries*:

Detroit

Based on figures for the first three weeks' business, it is estimated that new passenger car sales in October will approximate 5000. This would mean a further recession from last year's level, for passenger car sales in October, 1929, totaled 6693. The total for the first 10 months of this year probably will reach 109,000, comparing with 74,897 in the corresponding period last year. Ford continues to obtain more than one-third of all the business, with Chevrolet ranking next and Buick third. Stocks in both new and used cars are high and dealers are putting forth great efforts to move both classes of merchandise before the advent of cold weather.

(Continued on page 706)



Oxford Six Introduced by Morris Has Side Valve Engine

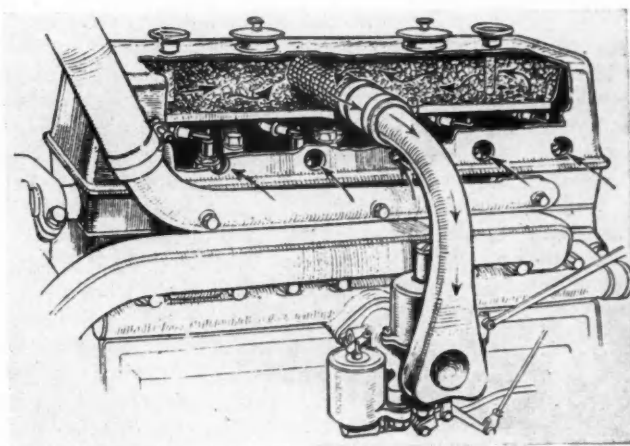
New Model, developed for English market, is smaller than the Isis, which was offered recently for export, having a powerplant which is rated at 15 h.p.

By M. W. BOURDON

SUPPLEMENTING the new "Isis" model intended primarily for export (described in *Automotive Industries* of Aug. 24), Morris has introduced another new six of smaller size to be known as the "Morris Oxford Six." Rated in England at 15 hp. on account of its cylinder bore ($2\frac{1}{2}$ in.) the engine has side valves instead of the overhead camshaft of the Isis; it develops 35 hp. at 3200 r.p.m. and embodies a novel system of combined air filtration and fume absorption. The wheelbase is 114 in.; track 56 in.

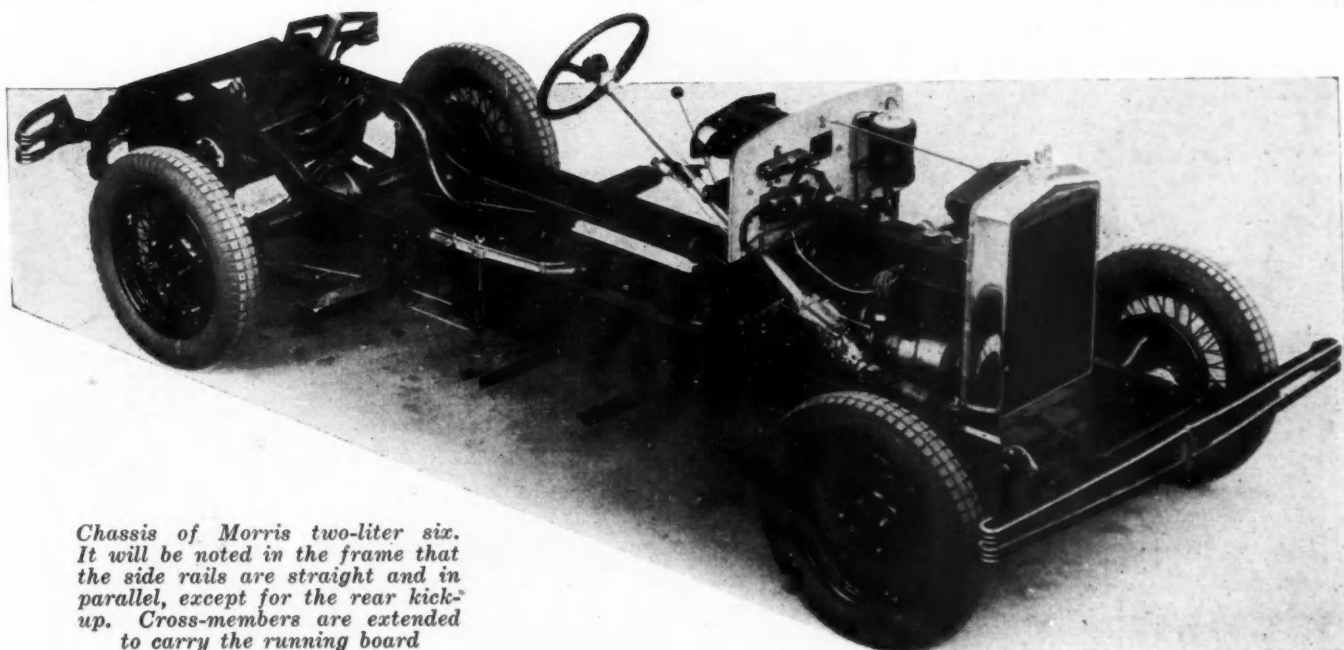
The engine has a bore and stroke 63.5 by 102 mm. (approximately $2\frac{1}{2}$ by 4 in.) giving piston displacement of just under two liters (1938 c.c.). The crankshaft has four bearings supported by top half of crankcase, which is continued well below crankshaft center line. Three-ring aluminum pistons and steel connecting rods are used. Camshaft is driven by duplex roller chain.

Fitting closely to the top of the cylinder head is a pressed steel cover, divided into upper and lower compartments, the lower inclosing the spark plugs, etc., while the upper contains closely packed horsehair and constitutes the air cleaner. The carburetor air intake



Drawing of Morris two-liter six engine showing air cleaner and fume absorber in overall cover

pipe extends into the cleaner compartment, and air passes into it from two sources; the main supply is



Chassis of Morris two-liter six. It will be noted in the frame that the side rails are straight and in parallel, except for the rear kick-up. Cross-members are extended to carry the running board

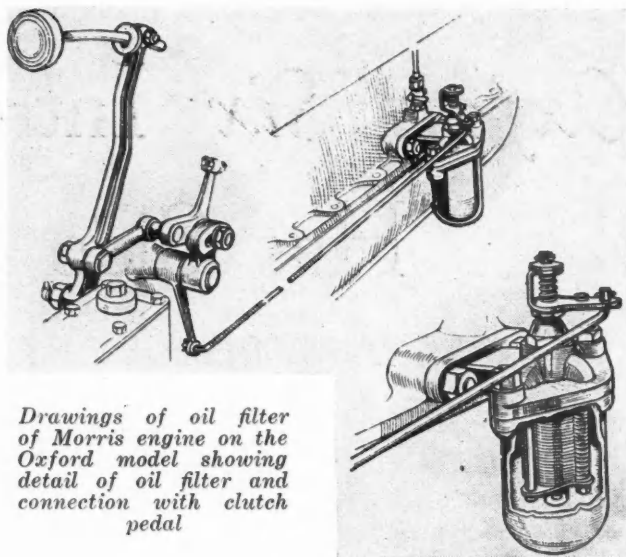
through six holes (communicating with the atmosphere) formed in the side of the lower compartment in line with and close to the spark plugs; the other supply is drawn from the crankcase by way of two ducts cast through the cylinder block and head, one at each end. The ducts form breathers for the crankcase, though the usual breather pipe is fitted to the latter to permit air to enter. Fumes in the crankcase are thus drawn up and then through the horsehair to the carburetor, instead of finding exit through breather pipe and penetrating from the hood space into the body. The oily vapor accompanying the fumes deposits some of its oil on the horsehair; thus, when the air that enters directly from the atmosphere under the hood through the six holes in the top cover passes through the oily horsehair, the latter collects any dust that may enter with it.

Provision is made for the quick removal of the cylinder head cover to give access to the spark plugs, and the latter and their cables are kept reasonably cool by the air that circulates in the lower compartment. This scheme serves also for heating the carburetor to secure vaporization, and affords a small measure of upper cylinder lubrication.

Full pressure lubrication is used, and a feature of note in connection therewith is the provision of a disk type external filter of which alternate disks are partially rotated relative to the others each time the clutch pedal is depressed; adjustable linkage runs from the clutch pedal to a lever which is friction-held to the vertical spindle of the movable disks. It is claimed that this provides a self-cleaning filter; sludge is rubbed off the disks and falls into a readily detachable sump.

Clutch is a multi-plate type with cork inserts, following the former Morris practice.

The general layout of the chassis is conventional, embodying a unit three-speed gearset, inclosed propeller shaft, spiral bevel drive and half-elliptic springs under-slung at the rear. Lockheed internal brakes with 14-in. drums are fitted for pedal actuation. A second pair of shoes in the rear drums is operated by a hand lever that lies normally almost horizontal and close to the floor on the right-hand side of the driving compartment (right-hand steering is fitted). The hand lever does not impede entrance to the driver's compartment from that side, and owing to the low front seat its handle grip is conveniently located. The primary pull-rod runs



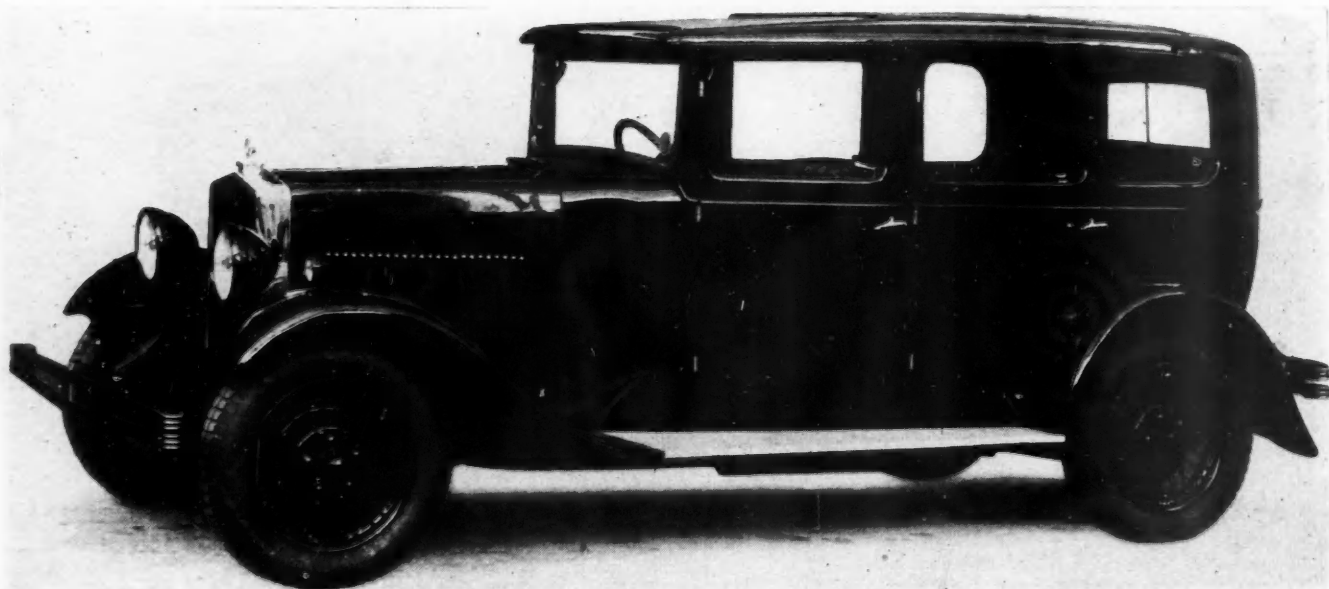
Drawings of oil filter of Morris engine on the Oxford model showing detail of oil filter and connection with clutch pedal

vertically from the lever at a point between the handle and the pivot pin and is there provided with a wing nut, enabling adjustments to be made if necessary while the car is running; rearward, actuation is effected by steel cables running over pulleys.

Departures from orthodox practice occur in the frame construction. In the first place, the side rails are parallel in plan and straight in elevation, apart from a kick-up over the rear axle. The front ends are not curved as usual, but are perfectly flat on their top surface, though tapered in section. Finishing off the front ends are stampings to which the bumper is bolted. A tubular cross-member passes through these stampings, projecting at each side to carry lugs for the spring shackles, the springs therefore being shackled at the front ends and pivoted at the rear; in the case of the rear springs both ends are shackled. All intermediate cross-members are supported under the side rails and are continued to carry the running boards.

The engine is mounted on four pressed steel brackets with rubber buffers. Water circulation is by pump, which is in tandem with the generator on the right-hand side, where also is the battery ignition distributor,

(Turn to page 693, please)



The sliding roof is a feature of the new Oxford two-liter six all-metal sedan

Carb-O-Flux Welding Process Speeds Mass Production

Combination of carbon arc and special wire of simplified gages permits high-speed fusions on thin steel sheets as well as numerous non-ferrous materials.

By J. B. GREEN

President, Fusion Welding Corp.

IN welding by any process, there is a variation in the heat as welding proceeds. When welding on heavy metals, this heat variation is but a small fraction of the total heat involved and the variation, as such, usually goes by unnoticed. As an attempt is made, however, to weld thinner materials, the variation becomes an increasingly important factor and finally, in certain processes, precludes their application.

Thus, the matter of welding thin sheets is very largely one of precision heat control. If too little heat be applied, the sheets will not be fused together. On the other hand, if too much heat is applied, the sheets will be burned through. Limits of variation are thus set and if, during the welding process, the range in heat variation is greater than that required to insure fusion and that which results in burning through, the process is not suitable.

As an example, consider the metallic arc process. Here all of the filler material must pass from the electrode to the work through the arc in the form of drops. As each drop passes, there is a decided change in arc length. In fact, the accepted practice of holding a short arc involves extinguishing the arc each time a drop passes. This means that the arc length varies from zero upward.

A wide variation in the heat developed from instant to instant is an inherent characteristic of the metallic arc process. On heavy work this is almost unnoticeable, because the heat in the weld itself and in the adjacent metal acts as a reservoir and prevents rapid heat changes as the drops pass. As a practical proposition, the limit of the metallic arc seems to be reached at approximately No. 14 gage sheet steel. Under certain conditions, lighter gages can also be welded commercially when special equipment or copper chills, etc., are employed.

Rather than attempt to extend the application of the metallic arc into the field of thin sheet welding, it would seem more logical to em-

ploy the carbon arc, thus eliminating the passing drops of molten metal with the consequent rapid variation in heat. Difficulty is encountered, however, from the very start. The carbon arc tends to pull off from the cold steel along the edges of the weld. The arc stream, of course, always follows the path of least resistance. If this path leads to the cold edges, the arc will naturally jump around in a manner which makes impossible anything approaching precision control by the operator.

Some years ago, the research laboratories of the Fusion Welding Corp. of Chicago, undertook to solve the problem. Their answer is now available in the form of the new Carb-O-Flux arc welding process. As the name implies, the process is a combination of a carbon arc and a suitably fluxed welding wire. The flux is designed, not only to protect the metal, but to generally steady the arc, and also insure the path of least resistance for the arc stream to lie invariably between the carbon point and the hottest spot, which should always be the center of the weld.

The process, as such, has been built up around this central characteristic. By proportioning the cross-section of the welding wire to the thickness of the sheets being welded, an inch of weld seam can be laid down with an inch of wire. This obviates the necessity for either retarding the filler material or leading it as the arc passes over the seam. The operator merely has to lay down the wire in the seam as fusion proceeds.

The process has been applied to metals other than mild steel. Aluminum and its strong alloys are welded readily by the Carb-O-Flux process. Copper is another metal which lends itself admirably to Carb-O-Flux welding. Many of the alloy steels, especially in the lighter gages, seem best welded by the Carb-O-Flux process. The alloy containing 18 per cent chromium and 8 per cent nickel, which is highly resistant, both to corrosion and scaling at elevated temperatures, is now welded easily.



Carb-O-Flux arc welded specimens, showing extreme weld ductility in 20-gage mild steel

Electric Industrial Trucks Save in Materials Handling

Survey shows use of power vehicles in 50 per cent of factories to reduce reloading, hauling and moving large unit loads in production operations.

By C. B. CROCKETT

Secretary, The Industrial Truck Association

MATERIALS handling has always received attention from the executives of the automotive industry, and has yielded handsome returns, giving this industry an enviable reputation for low handling costs.

It is of interest, therefore, to examine the results of a field survey on the subjects of materials handling in general and the use of electric industrial trucks in particular. It may also be mentioned that plants were included under the heading "automotive" which were engaged in the manufacture of parts or accessories as well as cars.

Table I shows the proportion of companies operating the different types of materials handling equipment.

By summarizing these percentages we find that the average number of types used in one plant

is 5.7, although 19 types are listed. If, however, we omit the five types most seldom used, we only reduce the average number used to $\frac{3}{4}$ of the remaining 14 types. Even this is a figure which illustrates the wide range of methods employed throughout the industry.

In spite of all that has been done to mechanize the handling of material we still find 90.9 per cent of the plants using hand trucks for some one of their principal

handling operations. This use of hand labor probably is confined to miscellaneous movement, and as the tonnage moved by each type of equipment could not be ascertained, the figures should not be regarded with alarm.

It is also interesting to note that, although conveyors have been so extensively used in cutting costs along the assembly line, monorails are used in 54.5 per cent of the plants, cranes in 50 per cent and electric low-lift trucks in 45 per cent. In fact, it was found the electric trucks of some type were used in over 50 per cent of the plants visited.

The next data of interest are the proportion of plants engaging in the various handling operations. These operations

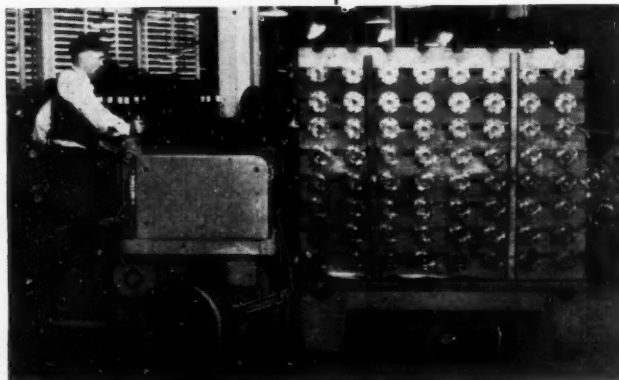
are divided into seven production steps and five miscellaneous operations connected with production. It was noted in the investigation that little had been accomplished in the application of mechanical handling to those operations which occurred as a service to production.

It is interesting to note that although nearly 70 per cent of the plants have eliminated the rehandling in and out of finished stores and move the material direct from last operation to the carrier, that less than 20 per cent of the plants have been able to move incoming

Table I

| Type | Per Cent of Total in Plants Interviewed |
|---|---|
| Hand trucks | 90.9 |
| Hand lift trucks | 77.3 |
| Gasoline trucks | 4.5 |
| Gasoline lift trucks | 4.5 |
| Gasoline tractors (including farm type) | 22.7 |
| Electric load carrying trucks | 9.0 |
| Electric low lift trucks | 45.5 |
| Electric high lift trucks | 22.7 |
| Electric crane trucks | 9.0 |
| Electric tractors | 13.6 |
| Industrial railway | 22.5 |
| Monorails | 54.5 |
| Overhead cranes | 50.0 |
| Tram-rail | 4.5 |
| Gravity conveyor | 18.2 |
| Belt conveyor | 36.4 |
| Other conveyors | 36.4 |
| Hand movement | 18.2 |
| Other equipment | 31.8 |

Fig. 1—Handling automobile parts on a rack skid at the Marmon Motor Car Co. plant. Material is received on the skid racks and moved directly to the start of the process without rehandling



Time

material direct to the first operation and eliminate the movement in raw material storage.

Conveyors, cranes and the larger fixed types of handling equipment usually were installed with the building. It is of interest, therefore, to see the circumstances which arose and resulted in the purchase of the more mobile type of equipment such as the electric industrial truck. In Table III, three main headings are shown, "Growth," "Improvement in Methods," and "Failure of Old Equipment." The other headings are subdivisions of the above giving more specific reasons.

Table IV should also be examined in connection with the above so that the two may be compared. Table IV shows the proportion of companies advancing reasons for not using the electric industrial truck.

The two Tables III and IV seem to show that improvement in materials handling is often the result of an increased demand upon the production facilities in the plant; that plant conditions seem one of the main obstacles and that improvements are deferred until new buildings are constructed.

If a 25 per cent increase in production can be effected in the same space through mechanical handling, does it not seem reasonable to assume that costs could be lowered by the same changes even if production remained at the same level? Also, if industrial electric trucks are so often bought at the time new buildings are put into service, does it not seem advisable to make some studies of the economies resulting from an improvement in the conditions existing



Fig. 2—Die handling truck built for the Studebaker Corp. This truck is capable of handling dies weighing from 30,000 to 40,000 lb.

Table II

Subdivision of handling operations

| Production | Per Cent of Plants Engaged in the Operation |
|--|---|
| 1—Raw material from common carrier | 100.0 |
| 2—In and out of raw material stores | 81.8 |
| 3—Moving through process | 100 |
| 4—Moving through assembly | 81.8 |
| 5—Moving through packing | 45.5 |
| 6—In and out of finished stores | 31.8 |
| 7—To shipping | 72.7 |
| Service | |
| 8—Supplies from storage to process | 68.2 |
| 9—Machinery or parts to or from use | 63.6 |
| 10—Repair and millwright service | 54.5 |
| 11—Miscellaneous | 72.7 |
| Average number production operations per plant | 5.1 |
| Average number service operations per plant | 2.6 |

Table III

Circumstances creating the need of electric industrial trucks

| | |
|---|-------|
| Growth | 76.9% |
| Increased production | 53.9% |
| New buildings | 23% |
| Improvement in Methods | 7.7% |
| Speeding up operations | 7.7% |
| Failure of Old Equipment | 15.4% |
| Loads too heavy | 7.7% |
| Hauls too long | 7.7% |

Table IV

Reasons advanced by companies using hand trucks

| | |
|--------------------------------------|-------|
| Narrow aisles | 57.1% |
| Narrow doors | 14.3% |
| Different floor elevations | 57.1% |
| Bad floor conditions | 14.3% |

in the old building?

What is the present tendency regarding the use of the electric truck in the automotive field today and what recent developments in methods or equipment point the way toward further savings?

The elimination of rehandlings, the handling of larger unit

loads, the saving of space, and lost time of machines and men may be listed as the demands made by executives concerned with the further lowering of handling costs. The first requirement is solved by the method rather than the equipment, the second is met by the manufacturers who are producing trucks of constantly increasing capacities, while the last two necessitate special machines or the adaptation of a standard model to serve a particular purpose.

The shipment of material on skid platforms is rapidly growing and now includes such material as



Fig. 3—Special truck developed for handling of sheet steel in 10-ton bundles. Truck is shown at the completion of the unloading operation, the bundle having been slid from the tilting platform while held with cables attached to electric winch

crankshafts, brake drum assemblies, steering assemblies, small parts, storage batteries, etc. Not only does this practice eliminate the handling incidental to unloading but in many cases the loads are stored along the line and only handled once before entering the assembly. Fig. 1 illustrates the use of a special rack skid for brake drums at the Marmon Motor Car Co.

Fig. 2 illustrates the heaviest electric industrial truck ever built. It has a lifting capacity of 40,000 lb. and is employed by the Studebaker Corp. for changing dies in the presses of their body department. Nearly all die-changing trucks are now equipped with an electric winch for pulling the die on or off the platform of the truck and speed up the operation, at the same time reducing the hazard to workmen. Some of these trucks are also equipped with flush rollers on the platform. At the plant of the E. G. Budd Mfg. Co. in Philadelphia a single truck of this type is effecting a saving of approximately \$110 per day.

Sheet steel has always presented a problem in handling. The truck shown in Fig. 3 is typical of the special designs worked out by the manufacturers and users to solve a specific problem. This truck handles 10-ton bundles of sheet steel without the use of any skid except two small timbers which are wired to the bundle.

The platform may be tilted in such a way that the edge rests on the floor next to the end of the bundle. A cable is then placed around the sheet and the load drawn upon the inclined platform by means of an electric winch. With the load in position the platform is lowered until horizontal. For unloading, the process is reversed and the cable slacked off as the truck is pulled from under the load.

At a large sheet mill this truck with one driver and a helper loaded a 40-ton car in 25 min. Damage

to the steel is also reduced by the use of this machine.

Although electric trucks are noted for the savings they make in direct labor costs, other factors are often worthy of consideration. It is said that the automotive industry is today producing five times as many cars per square foot of manufacturing area as was possible in 1922. Floor space is therefore an ever-present problem, and one case has recently

shown how industrial trucks may help in space conservation.

The Studebaker Corp. recently appropriated a quarter of a million dollars for a new body storage building. By further study, however, it was found that it was possible to increase the capacity of the present building. This was accomplished by the use of a temporary body support and the fork-type electric truck. Bodies are now stored on end and three occupy no more space than was formerly required by one. The total investment necessary

was approximately \$20,000, storage capacity was tripled and an expenditure of \$230,000 saved.

Another example of a special truck for the solution of a special problem is shown in Fig. 5. This is a cupola charging truck, designed for the Oakland foundry, and moves the charging buckets from the scale platform to a point under the openings in the charging floor. A special overhead monorail crane handles the bucket.

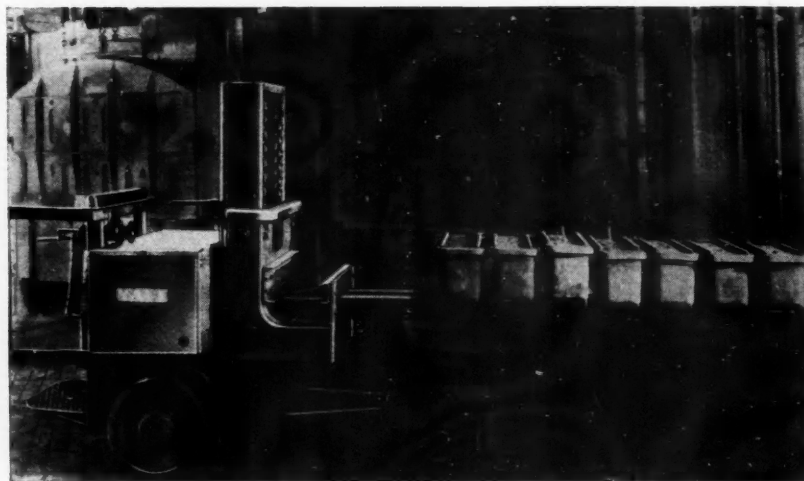


Fig. 4—Special fork-type truck developed for handling parts in and out of annealing ovens. The loss due to waste heat was reduced materially, due to the quick loading and unloading of the ovens



Fig. 5—Special cupola charging truck used at the Oakland foundry

Salisbury Lowers Hardening Costs By Using *Electric Furnaces*

Savings in operating time and maintenance expense made by the installation of two continuous pusher units. Devices replace four oil-fired box heaters.

By WIRT S. SCOTT

Westinghouse Electric & Mfg. Co.

THE Salisbury Axle Co., Jamestown, N. Y., manufactures automobile axles as a principal product. The forgings for such parts are heat-treated, machined to finished size and shipped to various automobile companies, usually as single units, but in some cases assembled with other parts.

A general dissatisfaction with heat-treating results prevailed, due to the increasing rigidity of the specifications of automobile manufacturers. Tightening of the specifications and increased inspection and testing improved conditions somewhat, but at the same time increased the factory cost, due to the added expense of testing and reheat treatment of rejected parts.

An investigation of the results being accomplished in heat-treatment, through the use of electric furnaces, resulted in a decision to install continuous pusher-type electric furnaces to replace oil-fired furnaces. In analyzing the proposition, the net results to be expected were:

1. Improvement in quality.
2. Reduction in rejects.
3. Better working conditions.
4. Increased cost of heating.

The average monthly production of front and rear axles and steering knuckles was 300,000 lb. a month, hardened at a temperature of from 1550 to 1600 deg. Fahr., quenched in oil and tempered at 950 to 1000 deg.

Four oil-fired furnaces of the box type were used, each having a hearth dimension of 4 ft. by

8 ft. Four smaller furnaces were used for miscellaneous parts and for stand-by equipment when the larger furnaces were out of service.

Alloy steel was being used for the front and rear axles, the specifications reading as follows:

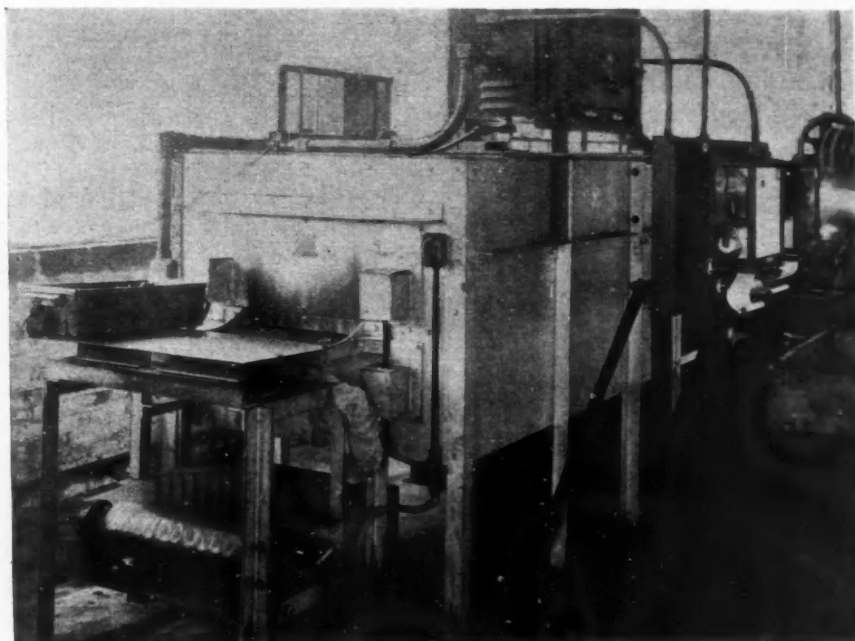
SPECIFICATION NO. 1

| | | | |
|----------------------------|---------------------|-----------------------------------|--------------|
| Carbon | 0.33 to 0.38 | Chromium | 0.80 to 1.10 |
| | Manganese | | 0.60 to 0.80 |
| 1. Heat to 1550 deg. Fahr. | | 4. Reheat, 900 to 1000 deg. Fahr. | |
| 2. Hold for one hour. | | 5. Cool in air. | |
| 3. Quench in oil. | | 6. Brinell test, 330 to 360. | |

SPECIFICATION NO. 2

| | | | |
|---------------------------------|--------------|----------------------------------|--------------|
| Carbon | 0.35 to 0.45 | Manganese | 0.40 to 0.70 |
| Chromium | 0.80 to 1.10 | Molybdenum | 0.15 to 0.25 |
| 1. Heat to 1550-1600 deg. Fahr. | | 4. Reheat to 950-1050 deg. Fahr. | |
| 2. Hold one hour. | | 5. Cool in air. | |
| 3. Quench in oil. | | 6. Brinell test, 310 to 345. | |

An investigation showed that the rear axles could be pushed through a furnace, when supported at each end by U-shaped slide blocks resting in channel rails. Front axles and steering knuckles, on account of their odd shape, could not be supported conveniently in this manner, hence it was decided to either load them directly on top of the rear axles, or by the use of nickel-chromium tubes taking the place of the front axles, lay the spindles directly on top of the tubes, pushing the entire mass



A small pusher type furnace used in the manufacture of automobile parts. Small cylindrical parts, such as piston pins, oil and water pump shafts, king pins, stud bolts, etc., are placed in the V-shaped grooves and pushed through the furnace, quenching automatically, in the case of hardening furnaces

through the furnace as a single unit and operation.

In practice both the above schemes were found to work satisfactorily. It is slightly more economical, of course, to place the spindles on top of the rear axles, dispensing with the tube, but this is not always possible, since the orders coming through the shop are not always so synchronized in proper proportion of front and rear axles to permit this being done.

In January, 1929, two pusher-type electric furnaces were installed to take the place of the four oil furnaces; one for hardening and one for tempering. The description of the furnaces is as follows:

HARDENING FURNACES Pusher Type Automatic Quench

Chamber dimensions in inches:

Length 192
Width 44
Height 30
Door opening
10 in. x 34 in.

Electrical capacity 177 kw.

Number of control zones 2

Division of control zones:

Heating zone 114 kw.

Soaking zone 63 kw.

Power supply, 3 phase, 60 cycles, 220 volts.

TEMPERING FURNACE

Pusher Type

Chamber dimensions in inches:

Length 168

Width 44

Height 30

Door opening 10 x 34

Electrical capacity 120 kw.

Number of control zones 2

Division of control zones:

Heating zone 60 kw.

Soaking zone 60 kw.

Power supply, 3 phase, 60 cycles, 220 volts.

The pusher mechanism for each furnace consists of a 1 hp. motor geared to an automobile crankshaft, which in turn is connected to a rocker arm or pivoted bar, which shoves the charge forward 4 in. at each revolution of the crankshaft. The furnaces are being operated at a rate of 42 strokes per hr. This can be changed to give a slower or faster travel by changing the gear and pinion on the driveshafts.

One man attends to the loading of the hardening furnace and to racking up the work when it comes out of the quench. The work enters the hardening furnace, is

preheated at a definite rate in the heating zone, and passes on to the soaking zone. At the end of the soaking zone is an enclosed chute terminating in the oil quench. When the axles reach this point they are discharged into the chute, and in a fraction of a second are in the oil. A continuous conveyor picks them up, and delivers them out of the oil to a point where the furnace

operator can receive them and prepare them for the next operation.

The tempering furnace is operated by one man, who places the axles at the charging entrance of the furnace and also unloads the axles at the discharge end. On account of the high temperatures used, the supporting rails for the charge beyond the exit end had to be somewhat longer, in order to allow sufficient time for the work to cool, for convenience in handling.

The hardening furnace is operated at a temperature of 1580 deg. Fahr., and the

tempering furnace at 940 deg. Fahr. The variation in temperatures at the point of maximum or soaking temperature is less than one-half of one per cent.

In hardening and tempering, two rear axles can be placed in holders one above the other, and front axles placed directly on top of them. With such an arrangement the production is 108 rear axles and 54 front axles per hour. The operation of the furnaces is entirely automatic. The heat-treaters put the product on one end and take it off at the other.

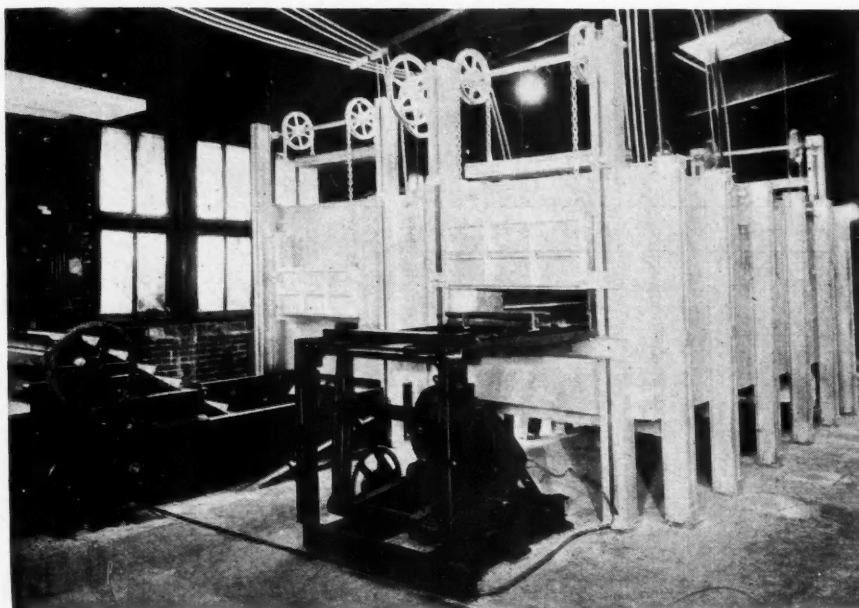
The weights of the individual parts heat-treated vary considerably. The average weight of the passenger car parts is as follows:

| | |
|-------------------|--------|
| Rear axle | 15 lb. |
| Front axle | 8 lb. |
| Steering knuckles | 4 lb. |

A summary of the items affected through electrifying are of interest, and they are described under separate headings as follows:

Operating Cost, Fuel and Electricity— Fuel Costs

Fuel oil was purchased in tank car lots at six cents a gallon. From the record of oil consumption per 100 lb. of product, the total cost of oil-hardening and tempering was 21.6 cents. Adding 22.5 per cent for the handling charges on the fuel, to cover air for atomization and interest on the money tied up in the fuel storage supply (\$0.0115 for air and \$0.0025 for interest charges per gal. of oil burned), the total cost per 100 lb. of product was \$0.2645.



The discharge end of the pusher type hardening furnace on the left, and the discharge end of the tempering furnace on the right. The quenching is done entirely automatically, the work progressing through the hardening furnace until it reaches a slot in the bottom and a chute extending from this slot below the surface of the oil. The work is picked up by a moving conveyor and deposited on a table, after which it is placed on the carriers and pushed through the tempering furnace

In a test made, 82,102 lb. were run through the hardening furnace and 57,150 lb. through the tempering furnace, with a total consumption of 13,600 kw. hr. In a second test there were hardened 161,790 lb. and tempered 107,575 lb., with a consumption of 25,600 kw. hr.

From an analysis of these tests based upon known furnace efficiency, power required for heating up, etc., it is possible to determine the kilowatt hours required to harden and temper 100 lb. of product.

TEST NO. 1

| | |
|---|-------------|
| Pounds hardened | 82,102 |
| Pounds tempered | 57,150 |
| Kw. hr. consumed | 13,600 |
| Total kw. hr. hardening | 10,101 |
| Total pounds of product | 82,102 |
| Total kw. hr. per 100 lb. hardening | 12.3 |
| <hr/> | |
| Total kw. hr. tempering | 3,479 |
| Total pounds of product | 57,150 |
| Total kw. hr. per 100 lb. tempering | 6.1 |
| Total kw. hr. per 100 lb. of product, hardening and tempering | 18.4 |
| Average power rate per kw. hr. | 1.17 cents |
| Cost per 100 lb. product, 18.4 x 1.17 | 21.55 cents |

TEST NO. 2

| | |
|---|---------|
| Pounds hardened | 161,790 |
| Pounds tempered | 107,575 |
| Kw. hr. consumed | 25,600 |
| Total kw. hr. hardening | 19,155 |
| Total pounds of product | 161,790 |
| Kw. hr. per 100 lb. of product hardened | 11.82 |
| Total kw. hr. tempering | 6,445 |
| Total pounds of product | 107,575 |

| | |
|--|-------------|
| Kw. hr. per 100 lb. of product tempered | 5.98 |
| <hr/> | |
| Total kw. hr. per 100 lb. product, hardened and tempered | 17.80 |
| Cost per 100 lb., 17.80 x 1.17 | 20.85 cents |

Comparative Costs

On the basis of a production of 300,000 lb. hardened and tempered per month, the cost of fuel or electricity is as follows:

| | |
|---|----------|
| Fuel oil, at \$0.2645 per 100 lb. | \$793.50 |
| Electricity, at an average cost of \$0.2120 per 100 lb. | 636.00 |

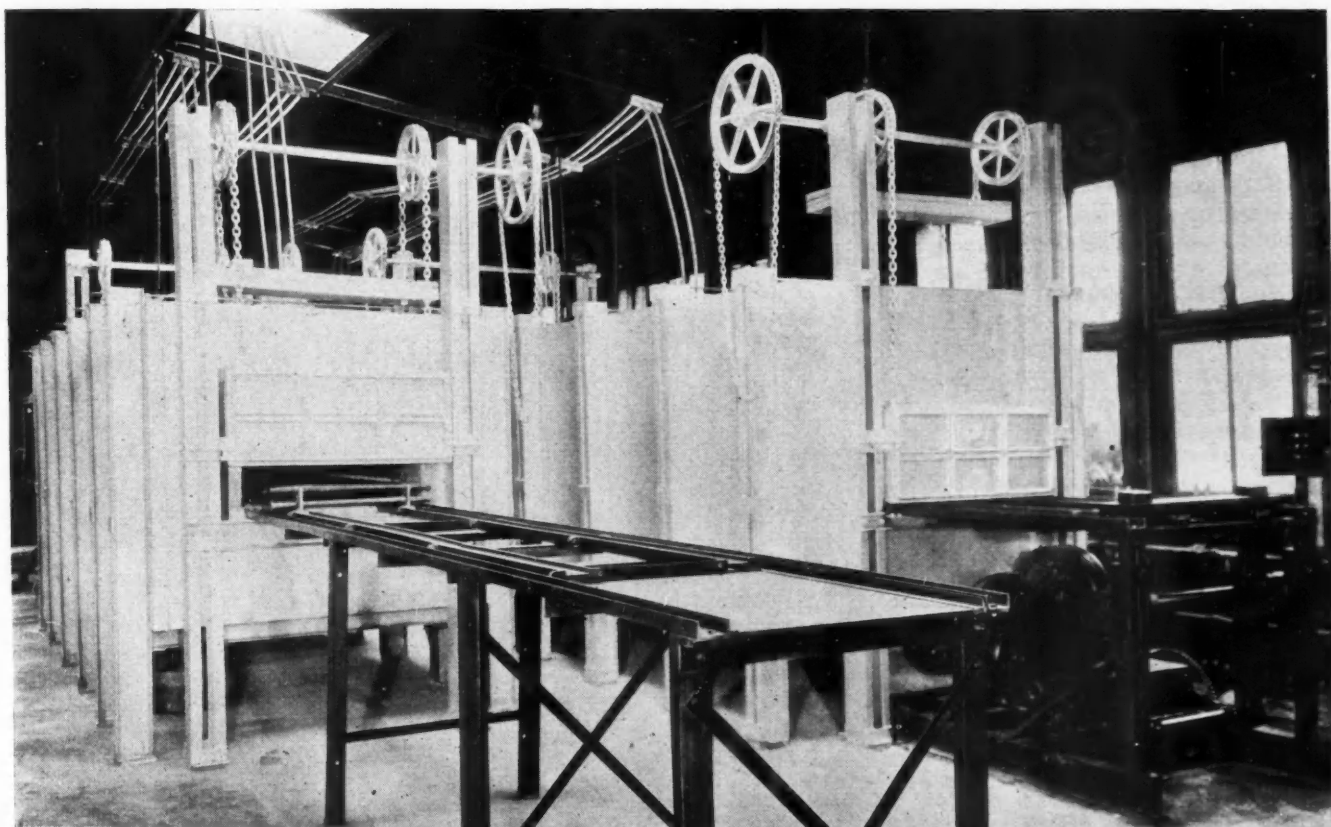
Total reduction in cost, using electricity . . \$157.50

Labor for Heat Treatment

When using fuel oil, three men at a total cost of \$1.25 per hour were employed. With electric heating, for an increased production, the labor charge was \$0.96 per hour. On a basis of 240 hr. per month, the saving in labor each month amounts to \$69.70.

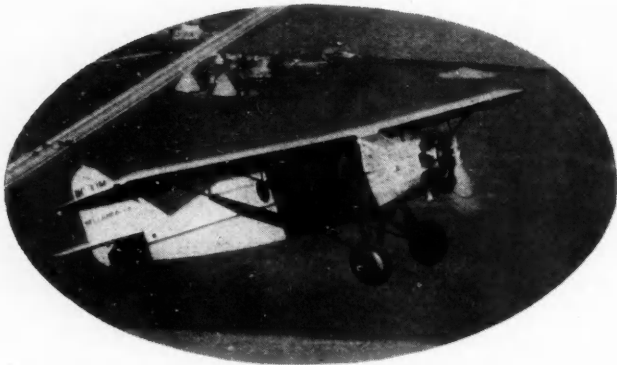
Saving in Labor After Heat-Treatment

After the spindle or front axle is heat-treated it goes to the finishing department, where there are eight drilling operations, six cutting and grinding, one threading and one keyway cutting operator. The tools in this department are run at the maximum speeds permissible, and in the past the tool breakage has been quite a large item. Since the use of electric heat the tool expense in this department has been reduced by more than one-half. This is explained by the fact that it has been possible to obtain such a uniformity of product that the machining conditions are always the same.



The charging end of the pusher type hardening furnace on the right, and the discharge end of the tempering furnace on the left. The hardening furnace is rated at 177 kilowatts, the tempering at 120 kilowatts, and are producing 300,000 lb. of heat-treated product a month

Airplane Production Calls for For Efficient Use



A Bellanca "Pacemaker," the type of plane which is produced as standard by the Bellanca Aircraft Corp.

MANY airplane production plants in various sections of the United States are faced with the problem of adapting a building not primarily designed for the production of airplanes to the requirements of the industry. Before the advent of straight-line "quantity" output, this was not a pressing problem, as the diversity of plants successfully producing a few planes per month will show. Faced with the problem of stepping up production to a possible maximum of 20 planes a month, the Bellanca Aircraft Corp., of New Castle, Del., found it necessary to reorganize its plant personnel in a way which would permit of maximum efficiency within the space available for production. Reorganization of personnel was accompanied by changes in the production layout scheme to permit the best possible use of floor space.

Production at the Bellanca plant follows a definite concentration ratio. Materials are assembled for the production of nine to 10 fuselages, while approximately eight fuselages are undergoing the actual assembly process, and three are undergoing final assembly.

The production line is in the shape of a horseshoe. This permits all assembly operations to be done within a single inclosure which would not be adequate for straight-line assembly. From the jig-assembly and welding of fuselages to spray-painting of the completed metal structure operation is in a straight line on one side of the inclosure.

The painted fuselage is then moved to the other side of the inclosure for mounting the engine. From engine mounting to final as-

sembly is a second straight-line movement, parallel to the initial assembly line. Wing assembly is done in an inclosure adjacent to the main assembly building, and the wings meet the fuselage about midway on the final assembly line.

Minor operations, such as upholstery, trimming and mounting of wood-fairing, templates, etc., are accomplished while the fuselage is on the second line. About 160 men are employed in the work of production.

The production manager's office, stockroom, metal shop, sawmill and wing assembly inclosures are located so that they are adjacent to the main production inclosure and have access to it. Entrance to the room where covering of wings, doping and painting are done is through a long passageway, with fire-doors at both ends. The experimental department is located in a separate building, which has an entrance into the doping room.

Since March 1 of this year, production personnel organization at the Bellanca plant has been according to the plan outlined on the chart reproduced herewith. The chart was developed and put into operation by G. E.

General view of the metal shop (below) at the plant of the Bellanca Aircraft Corp. Complete facilities for the fabrication of all metal structural parts are maintained



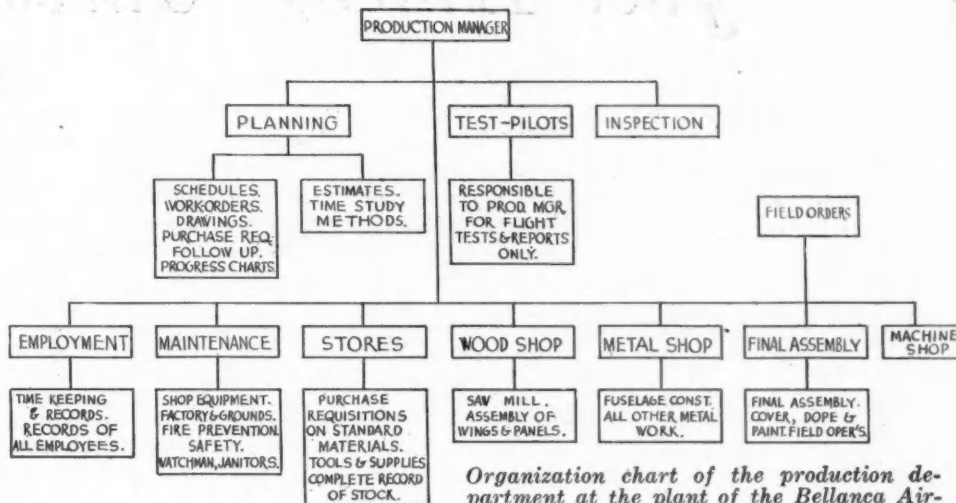
Interior of the main assembly inclosure at the plant of the Bellanca Aircraft Corp. Production is begun with fuselage assembly as shown in the above background, and ends in the left background, after proceeding in a horseshoe formation

Unusual Assembly Line Layout Of Space

By HERBERT HOSKING

Olson, production manager of the plant. Mr. Olson was formerly with the Naval Aircraft Factory in Philadelphia.

By means of the organization chart, the duties and responsibilities of the subordinate executives in the production department are kept constantly in mind. Existence of the chart, however, as Mr. Olson pointed out, does not mean that the organization formula is a cut and dried one, not susceptible to change. As the production schedule increases further subdivisions of authority may be made, or new activities added.



Organization chart of the production department at the plant of the Bellanca Aircraft Corp.

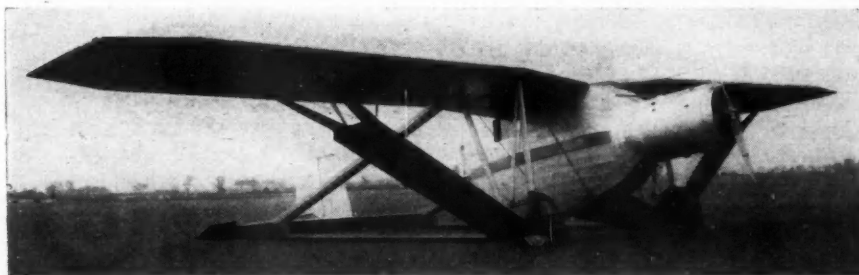
the subordinate executives in the production department, to supplement the organization chart. Changes of any sort in this scheme are issued as memoranda, and each subordinate executive is required to keep an up-to-date set of these memoranda, with a copy of the organization chart.

Foremen in the metal shops, sawmill, paint shop, etc., are directly responsible to the production manager.

Work orders originate from the production department and copies go to the foremen concerned. Materials are requisitioned by the chief storekeeper, provided they are for standard articles.

Orders for materials not listed as standard originate with the planning department. All orders for materials are checked by the planning department before they are forwarded to the purchasing department. The planning department is responsible for issuing purchase orders for covering necessary stocks of manufactured parts.

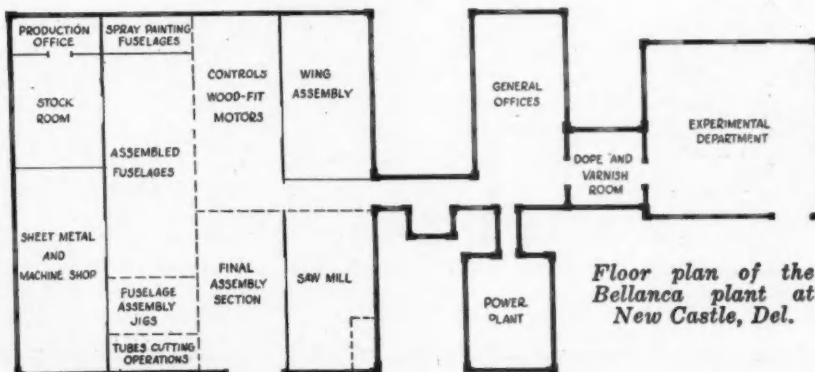
Insistence is made upon the keeping of exceptionally accurate records, and wherever possible every production operation is covered by a written record, for which the planning department is responsible.



A Bellanca "Tandem" plane, the latest production of the experimental laboratories at the Bellanca Aircraft Corp. Two Pratt & Whitney engines are mounted in tandem at the front of the plane, the after engine driving its pusher propeller from a 20-ft. shaft through the fuselage

At the Bellanca plant, the production manager is responsible directly to the assistant to the president of the corporation, in matters pertaining to his own department. In his own department, in all matters except company policy, he is the final authority, and this rule is strictly observed, as is the line of authority under the production manager.

The production manager acts as chief planner for the organization. In each of the two planning operation groups shown on the organization chart there are two men assigned. One secretary serves for the production manager and the planning department. One of the first activities of the planning department, under Mr. Olson's supervision, was the preparation of a complete statement of the responsibilities and authority of each of



Floor plan of the Bellanca plant at New Castle, Del.

Just Among Ourselves

Production Cuts are Basis for New Year's Progress

THE automobile industry over-produced? Yes, certainly; every factory man knows and admits that as regards the industry as a whole. Startling comebacks in sales and production are not expected within the next few weeks. But the fact remains that a goodly number of automobiles already have been made and sold in 1929 and that retail sales still are far from coming to a standstill.

Factory output has been cut drastically in many instances to give dealers a chance to unload accumulated stocks; in some other instances such drastic declines have been unnecessary both because sales are continuing at a fair rate and because over-production wasn't indulged in by the particular factory. In both cases the retail, and consequently the whole automotive, situation bids fair to be well stabilized within the next month or two. It is reasonable to predict that the decks will be clear for a sound, conservative progress as the new year starts.

* * *

After the Storm Comes a Tough Task

THE next six months unquestionably is going to try the mettle of factory, as well as of distributor and dealer sales organizations. Current over-production, appearing as it has concurrently with the greatest stock market debacle in years, has created a situation—partly economic and partly psychological—in which selling automobiles is going to be harder work for a while.

And no single unfavorable element appears which high-pressure treatment would seem to have any chance of making

better. Hard work, careful planning, intelligent, practical cooperation with retailers and thoroughly fair treatment of those same retailers, are the things which seem most likely to spell success for a factory in the sales campaigns of the next six months. The high-pressure boys are just likely to find themselves without anything or anybody to operate on.

* * *

We Can't Blink at Dealer Dissatisfaction

AUTOMOBILE dealers as a body today are dissatisfied. There can be no question about that in the mind of anybody who has contacted closely with this group of men in recent months. We who know the factory's problems—with its frequently hard and relatively fruitless efforts to get retailers to adopt sound merchandising methods, and the sincerity of its efforts in a majority of cases—*may* be able to prove that the average dealer is wrong and unjust in many of his contentions as regards what's wrong with the automobile business. And we *may* be right.

But the dissatisfaction of Mr. Average Dealer remains an existing fact which cannot be blinked at.

This average dealer is saying: "I still am subjected to constant clean-ups; not only do I object to them, but I'm financially unable to stand many more. My tenure as representative of a given make of car into which I put capital and effort still is rather uncertain. I still am subjected to periodic overloading. My used car situation doesn't get any better, largely because of overproduction. I have more trouble getting credit at my bank than I used to, because my profits aren't as large or as

regular as they once were. I'm in a tough game and sometimes it's hard to see victory ahead."

* * *

It Seems to be Up to the Factory Men

THERE is just enough of right in the wail of Mr. Average Dealer to make difficult the task of proving him wrong on those things in which he is wrong. And he certainly is wrong in some respects. But a long period of square-dealing, sincere cooperation and unimpeachable fairness on the part of the factory sales department is going to be necessary to gradually wear down the attitude of suspicion and antagonism which has been built up in the minds of many retailers.

We write this latter statement, not on the basis of any theories of our own, nor yet on the basis of what we have heard directly and indirectly from dealers. We write it almost solely on the basis of conversations held recently with important factory sales executives and on the basis of conversations between other factory sales executives about which we have heard. It seems to be generally agreed among progressive factory men that now—come what may—the automobile dealer must be put in a position to make money during 1930.

That general idea which seems to be running through the minds of factory executives more vividly at this moment than ever before, is a light so bright as to be capable of dispelling much of the gloom which adverse stock market reactions have brought to the industry in recent weeks. If actually held to by everyone, it might well mean the dawn of a new era in automotive marketing next year.

—N.G.S.

American Automotive Success Due to Efficient Planning

*French industrialist finds great financial resources paralleled
by advanced engineering of production problems
and research in the machine tool field.*

AT a recent session of the French Society of Automobile Engineers (SIA), M. Louis Cuny, general manager of the Electrical Equipment Co., S.E.V., gave a talk based on his visit to the United States, in which he sought particularly to make clear the reasons for the unusual industrial prosperity of this country and draw lessons therefrom for the French automobile industry.

"The astonishing prosperity of the automobile industry of the United States," said M. Cuny, "is made possible by the almost unlimited financial resources of the country." He draws the conclusion, however, that great financial power alone is insufficient to explain our outstanding industrial progress and that there are other causes, numerous and complex, of both a material and a moral character.

Production Planning

A great deal of the success of American automobile factories must be attributed to their planning departments. The high speeds of machining and assembly operations on the chain conveyor are due not to any special organizing ability of the foremen or to superior manual skill of American workmen, but principally to careful planning of production operations, to which task are assigned a considerable number of engineers, draftsmen, time-keepers, demonstrators, etc.

M. Cuny was impressed by an operation he saw in a spark plug factory. Doing the same work, every workman performed exactly the same movements, at

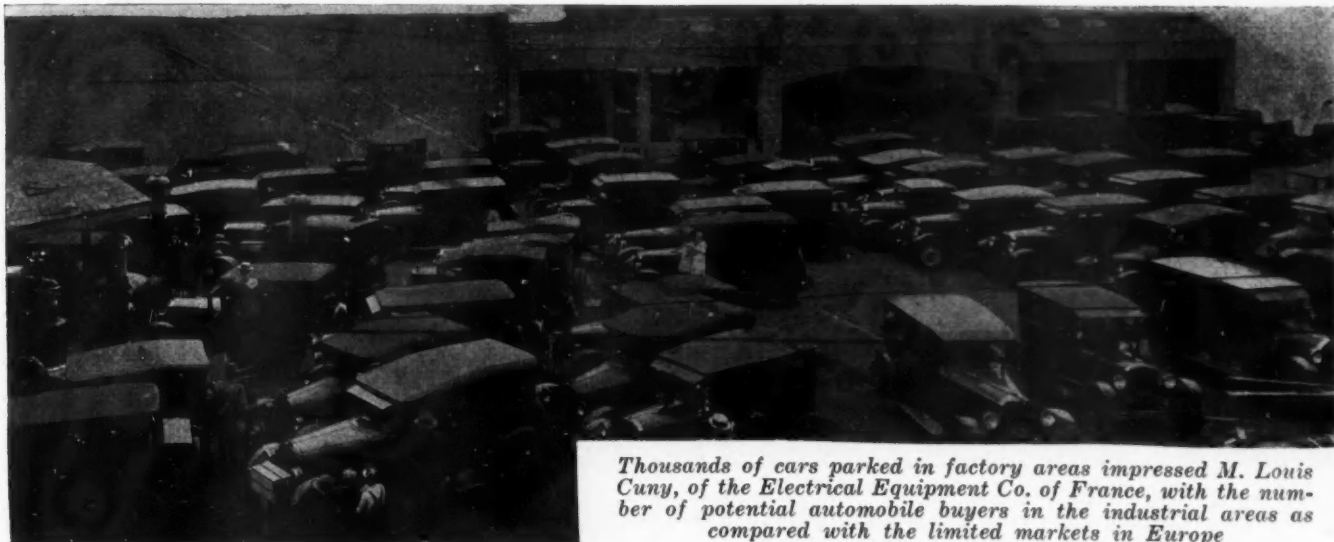
the same speed. Four plugs were grasped with the left hand at the same time, and passed on from it to the right hand, with which the machine was served. Both hands were busy all the time, not a fraction of a second being lost by either.

A little further along the plugs were being inspected by girls. They grasped three plugs in each hand at a time and then turned their hands in an appropriate and well-studied but fairly intricate manner before their eyes, during which motion they checked up on ten distinct points, after which they placed the plugs in receptacles according to the result of their inspection.

He found regularity of manipulations most impressive. To fully understand it, one must have first visited the department where engineers and instructors investigate the methods and movements best adapted to each job. Once these have been determined, workmen are trained in them for periods of from eight to twelve days. During this period their only care is to acquire the necessary skill.

"If a girl, for instance, has not developed the speed required at the end of the 12-day period," he stated, "the instructor does not conclude that she is not fit for employment. During this training period he has made efforts to discover her special aptitudes, and if she does not prove proficient at one particular job, she is transferred to another line of work that may better suit her temperament and her manual abilities."

It is also pointed out by M. Cuny that chain-conveyor assembly does not necessitate absolute identity of all the



Thousands of cars parked in factory areas impressed M. Louis Cuny, of the Electrical Equipment Co. of France, with the number of potential automobile buyers in the industrial areas as compared with the limited markets in Europe

product. On the contrary, chain assembly for automobiles permits of obtaining vehicles which are reasonably dissimilar, fitted according to the wishes of the purchaser, with either wood or metal wheels, with fenders of different profiles, with open or closed bodies, and finished in different styles of trim and different colors. Starting with the side rails, not even assembled into a frame, components are added until the fully assembled vehicle leaves the line to be directly transferred to the sales floor, all adjustments having been made with the resources of the assembling gang, and the assembly completed in a period of 40 minutes. This again is the result of proper organization, he found. Stocks of wheels, fenders, bodies, etc., are prepared in advance and supplies arrive at points along the assembling line exactly as required to produce vehicles meeting the specifications laid down.

It is evident that very careful planning of such an organization is necessary in order to prevent stoppages M. Cuny found. This can be accomplished only by groups of engineers, draftsmen, time-keepers, etc., who are relieved of all other responsibilities, and who are entirely detached from the operation of the production plant. Once the production methods have been determined upon by this planning department, it devotes its time to further improvements upon them.

All this no doubt occasions considerable expense, which seems the more objectionable by reason of the habit of entering it under overhead expense described as non-productive. "Are we sure," asks M. Cuny, "that we have done well when we have reduced our overhead proportion? There are certain so-called overhead expenses that pay a return."

Duties of Planning Department

The activities of the planning department, according to the observations of this French industrialist, include the study of sequence of operations, detail of each operation, choice of machine tools, design of appropriate tools and gages, setting of operation time, recruiting of foremen and operative personnel, and general shop organization, with respect to the production rate to be maintained.

M. Cuny thinks that such careful planning cannot fail to have a beneficial moral effect on the working personnel, which feels that its work is being given active and useful consideration, and the repercussion of these activities makes itself felt even in the commercial and financial organizations.

After having studied a considerable number of automobile parts in process of production, the speaker said, he was greatly impressed by the continuous efforts at simplicity in design, chiefly with a view to facilitating machining operations and thus lowering cost of production. This is at variance with the practices followed by some French designers and differs still more from the practices of German engineers.

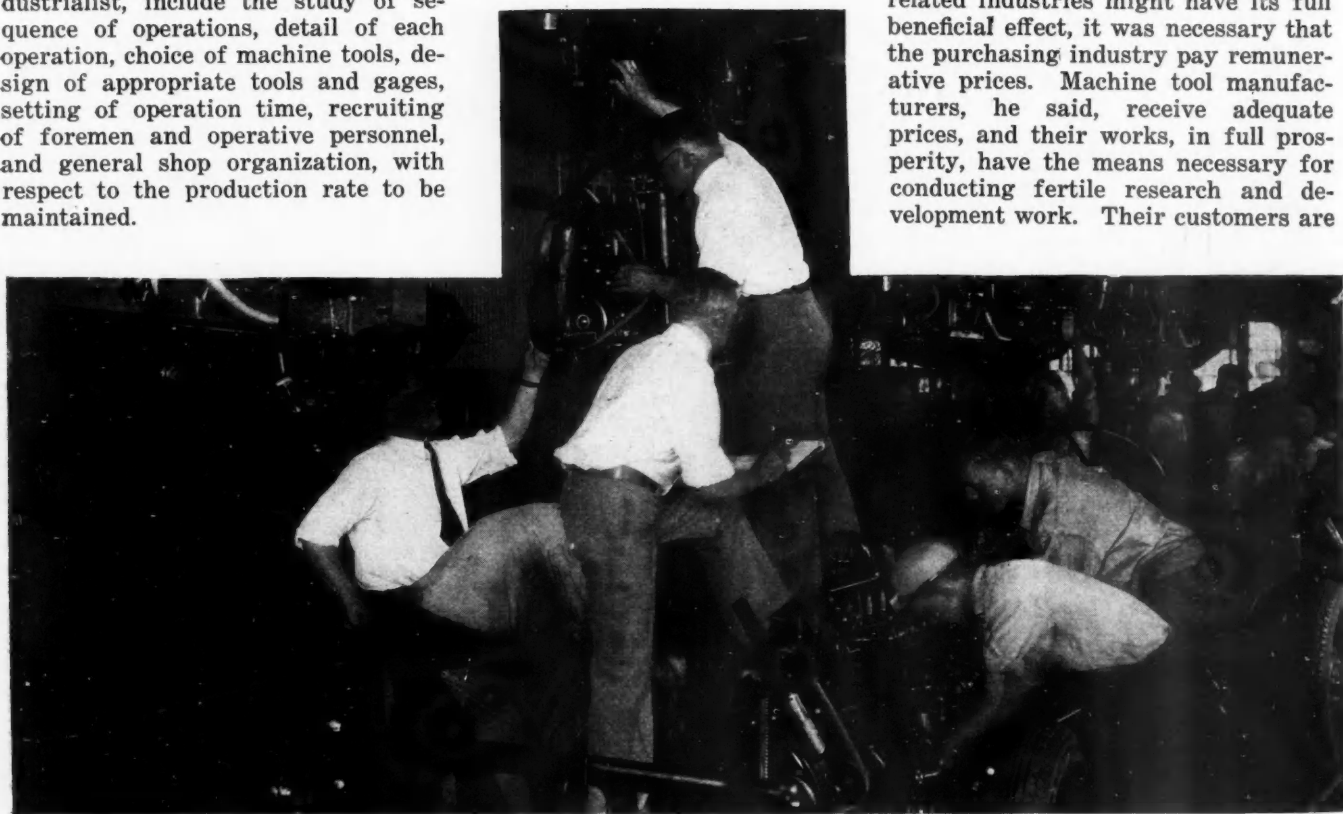
Designing for Easy Production

"It seems that in the United States the layout draftsmen have production men collaborating with them, whose sole aim it is to see that the parts are so designed that they are easy to produce," M. Cuny said.

"Credit must also be given for wide practical experience and great ingenuity in the study of machining operations and of tool equipment permitting of making large numbers of accurate parts in minimum time and with the least amount of labor. The 'tool-maker' spirit is strongly to the fore in operation planning, and the results are further improved upon by the adoption of superior mechanical and automatic handling methods."

For part of the success of the American automobile industry, M. Cuny gives credit to the machine tool industry, which, he says, has made equal progress. "The success of any one industry is tied up with the development of related industries. American automobile manufacturers find suitable machine tools in their own country, while we must import them at great expense from the same sources." The speaker further remarked that

in order that such solidarity between related industries might have its full beneficial effect, it was necessary that the purchasing industry pay remunerative prices. Machine tool manufacturers, he said, receive adequate prices, and their works, in full prosperity, have the means necessary for conducting fertile research and development work. Their customers are



Constant inspection and engineering supervision of automobiles while in the production and assembly line were found by M. Cuny, of the French Society of Automobile Engineers, to be fundamental reasons for the success of the American manufacturer

the first to benefit from this procedure, he believes.

At this point M. Cuny managed to get in a "dig" at car makers who insist on driving too sharp a bargain with accessories manufacturers. "It is poor policy," he says, "to put endless pressure on the accessories industries, thus exhausting their financial resources and compelling them to vegetate on their capital, without leaving them a chance to develop normally. The consequences of such leonine methods are not always to the advantage of those who want immediate profits above all else."

Machine tools used by American automobile manufacturers appeared to M. Cuny heavy and powerful, but, he says, they are run at high speed, rates for electric power are low, and it is not necessary to be niggardly with respect to current consumption. Low electric rates encourage profusion of shop lighting.

Articles of general consumption are mostly low-priced, which is partly due to low taxation, he found. This applies to gasoline, for instance. The result is a limitless development of consuming machines, such as automobiles, machine tools, etc.

Quantity Combined With Quality

Multiple-operation tools are greatly valued; they either work on a number of work pieces at the same time, fixed to automatic circular work tables, or a number of operations are performed simultaneously on the same piece. As an example M. Cuny mentioned a multiple spindle drill simultaneously drilling 47 holes of different diameters and different depths in an engine crankcase in 17 seconds.

As regards the precision obtainable in the manufacture of parts in large series, the speaker said his previous statements had brought out the care which was devoted to the machines, tools and fixtures. It was a mistake to believe that high precision could not be obtained under quantity-manufacture conditions, and he would go even further and assert that machine operations carried on at high rates of speed in suitable machines were incompatible with mediocrity in workmanship. If poor work were turned out, assembly on the moving chain would become impossible and an army of fitters would become necessary to rectify defects in parts before they would go together.

As a matter of fact, severe inspection is enforced, and a very high degree of interchangeability is obtained, and where absolute interchangeability is impossible, the parts are carefully stenciled, to make it possible to always obtain replacement parts that will fit. Vehicles made of such parts may be assembled without being run in and without being given a final test.

Large Financial Resources

"Adoption of all these elements, such as planning departments, powerful and improved machine tools, shop equipment and material handling installations, is facilitated by the large amounts of capital available, which make it unnecessary to balk at large outlays for equipment," M. Cuny said. By way of illustration he cited capitalization figures for concerns in the electrical equipment industry. North-East of Rochester has a capital of \$6,000,000; Auto-Lite of Toledo, \$8,000,000, and Delco-Remy of Anderson, Ind., \$30,000,000, in addition to which the latter concern has the support of General Motors Corp. The Frigidaire Corp. was able to spend \$20,000,000 in the course of the last few years to improve and extend the manufacture of its refrigerator.

Such large outlays, M. Cuny observes, are justified by the enormous outlets afforded by the American home market, aside from the export field. The population of

the United States, 120,000,000, is not really formidable as compared with the combined populations of three European countries, England, Germany and France, but what counts is that most of the inhabitants are potential buyers and, moreover, have a "buying mentality."

The Spending Habit

The "woolen sock" as a "first national bank" is an institution unknown in the United States. Money is regarded as of value only by reason of the well-being and the comfort which it will purchase. Consequently, the workman and office employee, the same as the manufacturer and capitalist, strive to keep money continuously in circulation. Money in movement is a useful force. This intense circulation of dollars is a source of new prosperity. It is precisely the large number of potential customers which permits of large scale production. This in turn justifies high-efficiency machine tools, and the resulting low price brings the article manufactured within the reach of all.

"The proportion of workmen who own automobiles is very large, in many cases of the order of 60 to 80 per cent of the entire factory force. The very large stands, where thousands of cars belonging to the workers are parked in the open air in or outside the factory yards, bear silent witness to this fact. This entire personnel, moreover, has become accustomed to the comforts of life and has need for the things making them possible and the proportion of those who have bath tubs (a piece of equipment which has become indispensable in American life), a refrigerator, a radio, etc., is very large.

A large part of American industrial success is ascribed by M. Cuny to the mentality of the American factory worker, whose habits and characteristics he goes into at considerable length. To quote:

Sense of Discipline

"In the factories and elsewhere one may observe a strongly developed sense of discipline. It seems that the mass of the population, at least in the industrial regions which we traversed, is imbued with this same spirit. Each one feels that it is to the general interest to conduct himself correctly and to observe the laws and regulations."

In American plants there is not the same sense of class difference which separates the various occupations in Europe. The very fact that the American workman is able to enjoy many of the comforts of life brings him nearer the capitalist, and the speaker went as far as saying that the only differences recognized in America were those of working capacity and intelligence; such differences are accepted as entirely natural by those less well endowed, and cause no enmity.

As another evidence of the good relations between workers and employers the speaker cited a case where the management of a factory made a proposal to retain \$1.50 each month out of the wages of each employee, in payment of an insurance premium. The plan was immediately given sympathetic consideration by the workers and was subscribed to by between 30 and 40 per cent of them the day after it was posted, and by 65 per cent within a week. The same proposition was made to the employees of a British subsidiary, but the latter immediately suspected a trap and called a meeting to discuss what might have been the sinister intentions of the management. Although the plan was very advantageous to the employees and placed a burden on the employers, it was accepted by only a small proportion of the workers.

M. Cuny makes many more complimentary remarks regarding the American workman, which space limitations make it impossible to reproduce here.

World's Engineers Gather at of Industries

Light alloys, a discussion of research and its economic importance, hydraulic feeds and speeds and use and construction of motor trucks are given in papers.

THE World Engineering Congress, at which engineers from all industrial nations are meeting to discuss their common problems, opened Oct. 29 in Tokyo, Japan. The amount of interest which the congress aroused in this country may be estimated from the fact that although only about 65 official delegates were appointed by the American organizing committee, a party of about 250 left on the two steamers chartered for the trip, which left San Francisco on Oct. 10. At the congress there were to be presented papers on a great variety of subjects covering all of the different phases of engineering work. Following are abstracts from some of the papers by American authors which deal with automotive or related topics.

Joseph W. Meadowcroft, assistant manager of the E. G. Budd Manufacturing Co., Philadelphia, presented a paper on The Importance of Welding in the Production of All-Steel Automobile Bodies, in which he dealt with the Budd company's practice.

Light Alloys were discussed in a paper by Zay Jeffries, metallurgist of the Aluminum Co. of America. This paper contains tables giving the compositions of 25 different aluminum alloys together with their usual commercial forms, their tensile properties and hardness, and the tensile properties of cast and wrought aluminum alloys at normal and elevated temperatures. The chief physical properties of aluminum were discussed as follows:

1. *Specific Gravity*—Wrought aluminum of 99.95 per cent purity has a specific gravity of 2.70. The specific gravities of the alloys can be calculated by the rule of mixtures with sufficient accuracy for ordinary purposes. The 13 per cent silicon alloy is the lightest of the commercial alloys with a specific gravity of 2.64, and the heaviest is the high zinc alloy with a specific gravity of about 3.0.

2. *Young's Modulus of Elasticity (E)*—Young's modulus of aluminum and most of its alloys is about 10,000,000 lb. per sq. in.

3. *Thermal Expansivity*—The average coefficient of thermal expansion of aluminum between 20 deg. and 100 deg. C. is about 0.000024 per degree Centigrade. The value of the aluminum-copper alloys used generally for automobile and aircraft engine pistons is about 0.000022 per degree Centigrade. Some alloys, high in silicon, having a value of 0.000019 per degree Centigrade or lower, permit the use of relatively small clearances in piston fitting.

4. *Electrical Conductivity*—For equal sections, commercial aluminum of conductor grade has an electrical conductivity about 61 per cent that of copper. The conductivities of the aluminum alloys in common use vary from about 30 per cent to 55 per cent of the copper

value. If higher electrical resistivity is desired, it can be obtained by the use of special alloys.

5. *Thermal Conductivity*—The thermal conductivity of aluminum at 100 deg. C. in C.G.S. units is about 0.51. The values for the alloys in common use vary from about 0.25-0.48.

6. *Resistance to Repeated Stresses*—The endurance limits of wrought aluminum alloys measured on the rotating beam type of machine vary from ± 6000 - $\pm 15,000$ lb. per sq. in. 500,000,000 cycles are considered sufficient to determine the endurance limit. The higher values are obtained in the heat-treated alloys of the dural type. Values for cast alloys vary from ± 5000 - $\pm 10,000$ lb. per sq. in.

7. *Behavior at Low Temperatures*—The tensile strength and elongation of wrought aluminum alloys in general increase with decrease of temperature, even to the temperature of liquid air ($-190^{\circ}\text{C}.$). The tensile strength of cast alloys increases also with decrease of temperature. Extensive use of both wrought and cast aluminum alloys in aircraft, in some instances under conditions of severe cold, indicates no difficulties from lack of low temperature toughness.

8. *Resistance to Corrosion*—Aluminum and many of its alloys are highly resistant to ordinary atmospheric corrosion. The alloys, however, are attacked slowly by salt water or a salt water spray. This attack is often not sufficient to be serious in the thicker sections usually obtained in castings and forgings, but may be very serious in thin sheet. The highly resistant qualities of nearly pure aluminum may be used to protect an alloy of high strength against salt water in spray corrosion. The United States Bureau of Standards has used a coating of nearly pure aluminum sprayed on to the surface of strong alloy sheet. The Aluminum Co. of America has succeeded in producing a composite sheet called "Alclad" sheet consisting of a heat-treated strong alloy coated with nearly pure aluminum. The latter is welded to the strong alloy and the composite sheet can be mechanically worked without loss of adherence of the coating.



Tokyo to *Discuss Problems*

Alclad sheet, even when quite thin, is nearly immune to salt water spray corrosion. A remarkable fact is that the strong alloy exposed at a hole or edge is also practically immune from attack because of electrolytic protection by the coating which has the higher solution potential.

In a paper on Industrial Progress Made Through Research and Its Economic Importance, Dr. Willis R. Whitney, vice-president and director of the General Electric Co. Research Laboratory, said research is one parent of industrial growth, the other being the will to live better.

On the subject of the need of industry to conduct research Dr. Whitney had the following to say:

"It is easy to speculate in industrial futures, but to do it carelessly is not industrial research. Every industry interested in future growth should devote to scientific research a small fraction of its profits. But what fraction shall it be? Experience and not experts should decide that, bearing in mind the possibility of a greater investment by competitors."

As regards the benefits of research to humanity the author's comments were as follows:

"Attached as I have been to an industry in which

active research is a habit, I cannot fix in my mind any upper limit to useful novelty, though I can for the rate at which it may be sought. For that reason I am interested in the statement of Haldane, the biochemist: 'It is quite likely that after a golden age of happiness and peace, during which all the immediately available benefits of science will be realized, mankind will very gradually disintegrate.' This seems based on bad arithmetic. I hope that the golden age of happiness and peace will forever be the one just ahead of the present and that for which man can forever prepare. There are several hundred thousand years of experience which warrant this hope. I think that the world can no more realize 'all the immediately available benefits of science' than one could realize the volume or capacity of an infinite pyramid by starting blindly to creep along one of its outer edges."

A. L. DeLeeuw, consulting engineer of Plainfield, N. J., in a paper on Hydraulic Feeds and Speeds, summarized the theoretical advantages and disadvantages of hydraulic feed as follows:

The amount of feed can be varied by infinitesimal steps between the maximum and minimum required by the machine.

The feed is not subject to the irregularities caused by the action of gear teeth or by the spring of shafts in an ordinary mechanical feeding device, and as a result it produces a smoother finish.

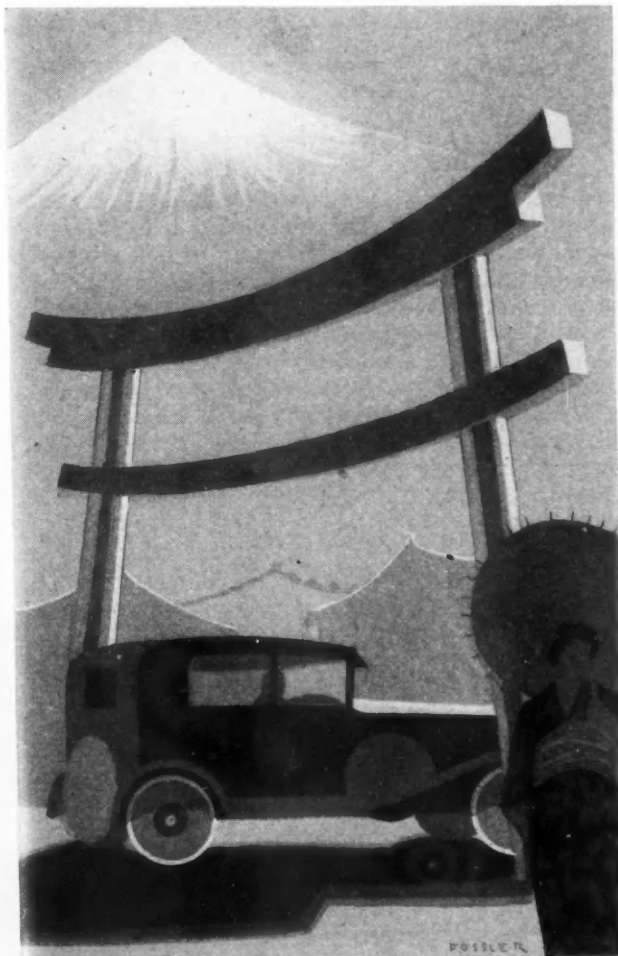
The device can be, for the greater part, outside of the machine, so that in its very nature it can be applied as a unit to any machine, whatever its kind or style, though, of course, for economical reasons, one would naturally use a few sizes of pumps for various sizes of machines.

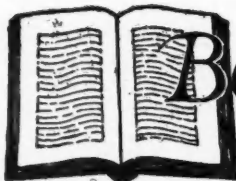
It is claimed that the same size of machine is capable of heavier cuts when using hydraulic feed than when using a mechanical feed. Definite and well-thought-out tests should be made to establish this fact.

The losses in feed power are said to be less with the hydraulic feed than with mechanical arrangements. It should be realized that this statement is rather broad and depends entirely on the construction of each of the two devices used.

B. B. Bachman, chief engineer of the Autocar Co., Ardmore, Pa., presented a paper on Factors Governing the Use and Construction of Motor Trucks. He pointed out that the chief field of the motor truck is in haulage work formerly accomplished by means of horse-drawn vehicles. For strictly retail delivery in a restricted area it is difficult to obtain the same efficiency as with the horse, although some of the designs which have been developed for this class of work are promising. In hauling freight to distances up to several hundred miles the motor truck overlaps the facilities of the railroads and its use in this class of service is justified only by the value of the commodity, the saving in time and the elimination of handling at terminals and transfer points.

Looking into the future, Mr. Bachman sees a further increase in power and increased use of six-cylinder engines with a possibility of the use of eight cylinders.





Books for the Business Bookshelf

Motor Vehicles and Tractors

By P. M. Heldt. 672 pp. Illus. P. M. Heldt, pub. \$8.

MOTOR Vehicles and Tractors is the title of P. M. Heldt's latest contribution to automotive literature. In a general way, it takes the place of Volume II of the Gasoline Automobile, which was entitled Transmission, Running Gear and Control. It is presented, however, under a new title rather than as a revised edition of a former work, not only because of the extent of the revisions but also because the scope of the work has been expanded to include heavy commercial vehicles and tractors.

With the exception of a small amount of material mainly dealing with fundamentals, the book is brand new as to text and illustrations. Revisions have been made with a thoroughness that is characteristic of the author so that the latest in automotive design practice is presented.

Among the new features of the book is a chapter on toothed gearing. Other new chapters cover independent suspensions, chassis lubrication, gas-electric drives, tractor design, fits and tolerances, and methods of rust prevention. In addition data on six-wheeled vehicles and front-drives have been added.

Discussions of production methods have been omitted from the new book because of the rapidity with which changes are taking place in the manufacturing practice and also because space did not permit a thorough discussion of the subject.

The new book is designed as a reference book and for the use of students of automotive engineering. It merits a place in every automotive engineering library for it is a worthy companion to Mr Heldt's other works, which are among the standard technical books of the motor industry.

International Airports

Stedman S. Hanks, The Ronald Press Co., New York. 195 pp. Illus. \$5.

ALIEUTENANT-COLONEL in the Air Corps Reserve, the author of this book, made a tour of the more famous European airports for the purpose of learning "in what ways their greater experience in international passenger air traffic could serve as a useful guide for airport construction and management in this country." He follows the general method of comparing representative European airports with outstanding airports in this country, pointing out as he goes along their essential differences which are a result largely of the fact that "while Europe has specialized largely on the development of passenger routes, America has taken the lead in night flying for the transport of mail."

An interesting feature of the book is a chapter describing a composite airport which combines the best features of European and American practice, and is adaptable to the widest possible use under all conditions. This and other chapters on airports management, lighting of airports, and suggestions for making airports profitable, should prove of practical value to airport executives and others who have a practical interest in the progress of aviation. In many respects the book

may be considered as a supplement to "Airports and Airways," by Lt. Donald Duke, its predecessor in the Ronald Aeronautic Library.

The present book is liberally illustrated and contains unusually good diagrams of airport lighting arrangements, etc. There are four appendices containing the International Air Navigation Convention, the Pan-American Convention on Commercial Aviation, typical International Air Commerce Regulations, and the contract of the Berlin Airport Co. contract for comparative purposes.

Machine Design

By P. H. Hyland and J. B. Kommers. McGraw-Hill Book Co., Inc., New York. 448 pp. Illus. \$4.

THIS book is intended as a comprehensive text on machine design. But what appeals to us is its modernism as reflected in constant references to current practice and research of various investigators and the leading engineering societies. Certain topics deserve special mention. Among these are, the presentation of the latest known material on the fatigue of metals and a concise discussion of the proposed American standards on tolerances and fits. The book closes with a well-chosen treatment of safety engineering as it applies to design of production machinery.

Internal Combustion Engines

By Robert L. Streeter and Lester Clyde Lichty. McGraw-Hill Book Co., Inc., New York.

ANEW edition of the treatise on internal combustion engines by Robert L. Streeter and Lester Clyde Lichty has recently been issued by the publishers, McGraw-Hill Book Co., Inc., New York. The book is of the text book class, each chapter being followed by a number of exercises for the student. In the preparation of the present third edition much descriptive material was eliminated and each subject approached with a treatment of underlying principles as they are now understood. A number of chapters of the last previous edition were completely omitted and chapters on engine lubrication, valves and valve mechanisms and engine balance and vibration were added. While the book deals with all types of internal combustion engines, including Diesel engines, most emphasis has been placed on automobile and aircraft types.

Popular Research Narratives. Vol. III

Collected by the Engineering Foundation, New York, 1929. Illus. \$1.

THE foregoing volume is a collection of 150 short descriptions of recent developments or discoveries in science which have had practical application in industry. In many instances the story of the invention is written by the discoverer, in others it is written from data supplied by the man concerned. Most of the "narratives" show exceptional skill in presenting scientific discoveries in language intelligible to the layman, for whom the volume is chiefly designed, although it should prove of value to workers in one branch of science who wish to keep posted on developments in all the others.

There are many chapters which should prove of interest to the automotive engineer and executive.

Ford Four-Speed Transmission Announced for Trucks

A NEW four-speed transmission is now in production on the Model AA Ford truck. Greater pulling ability in low and reverse is provided by the new unit, low gear giving a total reduction of 33.08 to 1, with a 5.17 to 1 rear axle ratio, compared with 15.95 to 1 for the former low gear. In fact reduction of the new transmission in second is just about equal to the low gear of the three-speed gearset.

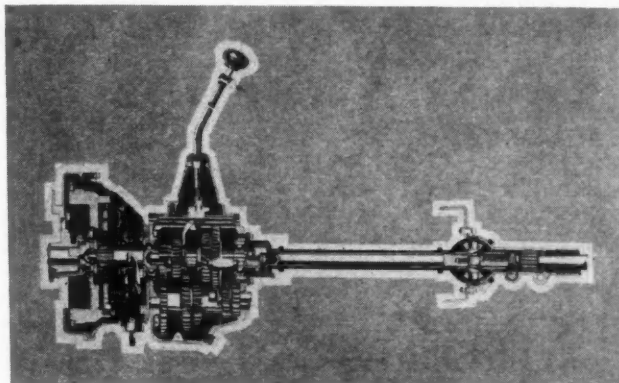
Second speed of the new transmission occupies the same gear shift position as low of the three-speed unit. Low is to the left and forward, which was formerly reverse. Third speed is to the right and forward and high gear is the same as before. Reverse is now engaged by operating a latch on the lever and then moving all the way to the right and then back.

Gear ratios of the four-speed set are: Low, 6.4 to 1; second, 3.09 to 1; third, 1.69 to 1, and direct in high. Reverse is 7.82 to 1. Corresponding ratios of engine to rear wheels with high or low rear axle ratios follow:

| | | |
|-------|------------|------------|
| Speed | 5.17 ratio | 7.25 ratio |
| High | 5.17 to 1 | 7.25 to 1 |
| Third | 8.74 to 1 | 12.25 to 1 |

| | | |
|---------|------------|------------|
| Second | 15.97 to 1 | 22.4 to 1 |
| Low | 33.08 to 1 | 46.4 to 1 |
| Reverse | 40.43 to 1 | 56.69 to 1 |

An opening is provided on the right side of the transmission case for a power take-off. Power is taken from the cluster gears. The opening is covered by a steel plate.



Cross section of new Ford Model AA four-speed transmission. Anti-friction bearings are used throughout, except on reverse idler. Transmission case bolts to bolted clutch housing. At right is universal joint on forward end of torque tube. A frame cross-member supports the torque tube, relieving the transmission case of this strain

Gears and shafts are of chrome alloy steel, heat-treated. Roller bearings are used on the countershaft and on the pocket or spigot connection. Clutch shaft and driveshaft are mounted on ball bearings, the front bearing being an S.A.E. 209 and the rear an S.A.E. 307. The reverse idler is carried on a bronze bushing.

An inclosed coupling shaft connects the new transmission with the forward end of the rear axle torque tube. At the front power is transmitted through an internal-ex-

ternal tooth coupling. These teeth permit an angular movement of 5 deg. At the rear is an inclosed self-centering universal joint. Center to center distance between joints is 20 in. The coupling shaft is on direct lines with the crankshaft of the engine and makes an angle of about 3 deg. with the top of the frame.

Oxford Six Introduced by Morris

(Continued from page 676)

extending vertically from the generator casing. On the left side of the cylinder block is the water uptake to a rear extension of the radiator top tank and at the right-hand bottom corner of the tank is a thermostat which operates radiator shutters. An S.U. carburetor is used, its outlet flange being bolted at the center of a straight induction manifold with short right-angle elbows bolted to the cylinder block on the same side. Fuel feed is by vacuum from a 13 (Imp.) gallon rear tank.

Steering equipment comprises a Bishop cam and lever gear, which is secured well above the frame level to afford accessibility to the junction box of the lamp, generator and headlight dimming switches, the control lever of which is above the center of the steering wheel, where also are throttle and ignition levers. The wheels are of the Dunlop wire-spoke type secured by studs and carrying 28 x 5.25-in. tires.

Four types of bodies have been standardized for this new chassis, a five-seated phaeton with all-weather top, a four-seated four-light coupe with sliding roof, a fabric sedan with six lights and integral luggage locker at the rear, and an all-metal sedan with sliding roof. Chro-

mium plating and Triplex glass are standard throughout on all models.

This new six will eventually supersede the four-cylinder 14 hp. Morris Oxford model, though the latter is being continued for awhile at reduced prices not yet announced.

The Morris "Isis" Six displaces the 1929 16-40 hp. four-cylinder and the 17.7 hp. six.

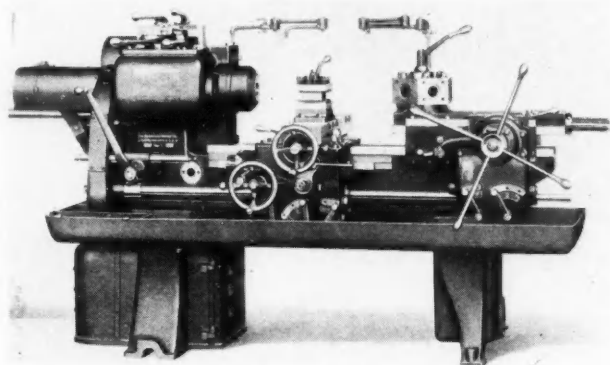
TESTS and demonstrations were recently made in the Rhineland of a motor truck fitted with an Imbert gas generator producing combustible gas from lignite. The Imbert generator is a French device and the tests were made at the instance of the German lignite association by the Deutsche Gasgeneratoren Company of Bonn. The ordinary engine is used but the compression is increased to 8 to 1, so that as much power is obtained as ordinarily with gasoline in an engine of the same displacement. The truck was run for 13 hours continuously on a number of consecutive days. It is claimed that the fuel cost is reduced 90 per cent as compared with the use of gasoline.

NEW DEVELOPMENTS—Automotive

Universal Turret Lathe

A NEW No. 5 Universal with a 12-speed all-gear head has been added to the line of ram type turret lathes, manufactured by the Warner & Swasey Co., Cleveland, Ohio.

This machine has a bar capacity of 2 in. for round stock, and 13 in. effective turning movement of the



No. 5 Universal turret lathe

turret slide for any one setting of the saddle along the bed. The maximum swing over the bed is 19 in. and over the cross slide, $9\frac{1}{4}$ in.

Twelve spindle speeds are available, ranging from 26 to 658 r.p.m., and are obtained through hardened alloy steel gears sliding on hardened multiple-splined shafts. A patented speed indicator, shown in Fig. 1, instantly shows the spindle speeds for the various position of the levers.

There are four cutter positions on the square turret and one on the rear tool post. The square turret can be quickly indexed and clamped by a quarter turn of the lever. Six independent adjustable stops carried on the stop roll are employed to throw out the longitudinal feed.

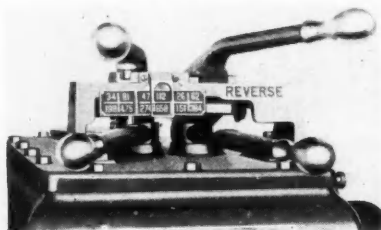


Fig. 1—Speed indicator

A new type of hexagon turret unit incorporates several features which will tend to prolong its accurate life and add to its rigidity. First, the slide moves on hardened steel ways, and secondly, the top caps have been made heavy and fitted with horizontal taper gibs to secure better adjustment for wear at the top surface of the slide.

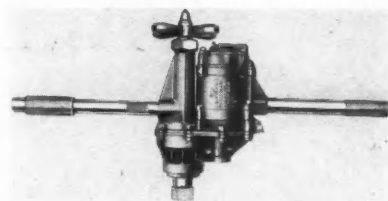
Rotary Pneumatic Drill

THE Independent Pneumatic Tool Co., 600 West Jackson Blvd., Chicago, has developed a new rotary pneumatic drill, the Thor 275.

It is a one-man drill and is said to operate smoothly and without vibration. One of its features is that it carries a 50-lb. load at the same speed that it runs free. It carries a 100-lb. load at a reduction in speed of only

30 per cent. This is made possible because the governor has opened the throttle. Between holes it idles along under governor control consuming only a few feet of air.

The Thor 275 drill has a drilling capacity of $1\frac{1}{2}$ in. and a reaming capacity of $1\frac{1}{8}$ in. Its governed free speed is 350 r.p.m. and the weight is 35 lb.



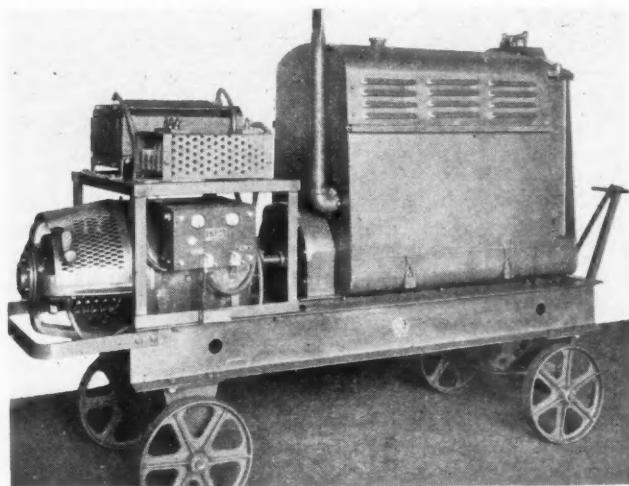
Thor rotary pneumatic drill

Portable Arc Welder

A NEW portable electric arc welding machine Model WD-300-A announced by the General Electric Co. is driven by a six-cylinder gas engine, and replaces the four-cylinder engine-driven unit previously included in that company's line.

The new engine is the Buda Model HS-6 power unit of $3\frac{3}{8}$ -in. bore and $4\frac{1}{2}$ -in. stroke, built especially for industrial service. It is totally inclosed in a sheet-metal housing. Gasoline consumption averages 2.4 gal. an hour for average welding duty at full normal-rated load.

The welding generator is a ball-bearing, self-excited, single-operator machine rated 300 amp., 1 hour, 50 deg. C., with a current range of 90 to 375 amp. in accordance



Portable arc welder

with N.E.M.A. standards. Included with the set is a current-reducing resistor by means of which welding currents down to 25 amp. may be obtained.

A 500-amp. ammeter and a 120-volt voltmeter are mounted on the generator panel. A self-adjusting stabilizing reactor automatically steadies the arc. Automatic regulation is obtained by specially designed magnetic circuit without any moving parts.

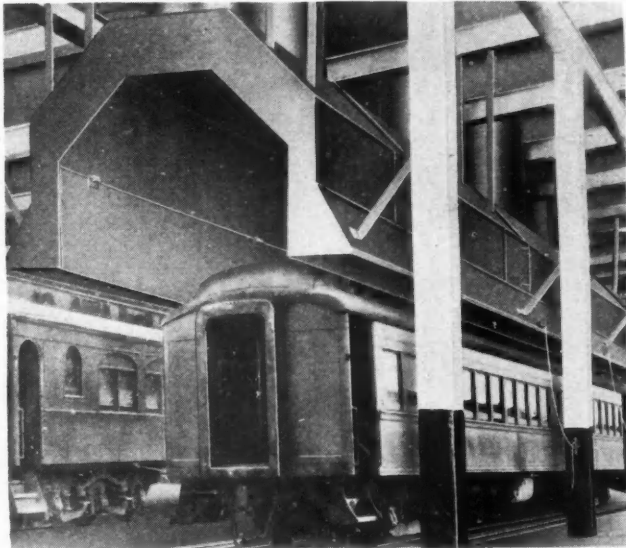
New Exhaust Equipment

THE new exhausting installation developed by the DeVilbiss Co., Toledo, Ohio, is of the canopy type and is said to be efficient as a ventilating system for

Parts, Accessories and Production Tools

large areas involved in any spray-painting operation, such as painting and finishing railroad cars, street cars, buses and large objects.

Partition, side-wall, or any other segregation of painting location is entirely avoided in this new type exhaust



DeVilbiss exhausting installation

system. In operation thin streams or curtains of air flow closely to sides of car, from the floor slots to the canopy, with a velocity just sufficient to remove instantly all fumes and odors resulting from the varnish or lacquer spray operation.

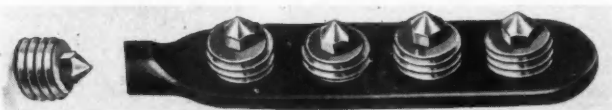
From the lower opening in the canopy to the open air is a short, direct exhaust movement induced and highly accelerated by means of motor-driven fans, located in all-metal pent houses above the roof of the building.

This type of exhaust equipment is made in both stationary and portable models. The portable installation is motor driven with automatic control and a stopping switch. This enables the user to take it to the work and avoid the necessity of spotting cars to a certain location.

Thread Button Center Punch

THE "Make-Shur" thread button center punch set, recently added to the line of the National Machine Tool Co., Racine, Wis., is said to simplify the layout of blind hole location.

By means of this tool it is possible to mark blind



"Make-Shur" thread button center punch

holes accurately and with facility. As shown, the center punch set consists of four buttons and a holder which retains the buttons and serves as a socket wrench in using them.

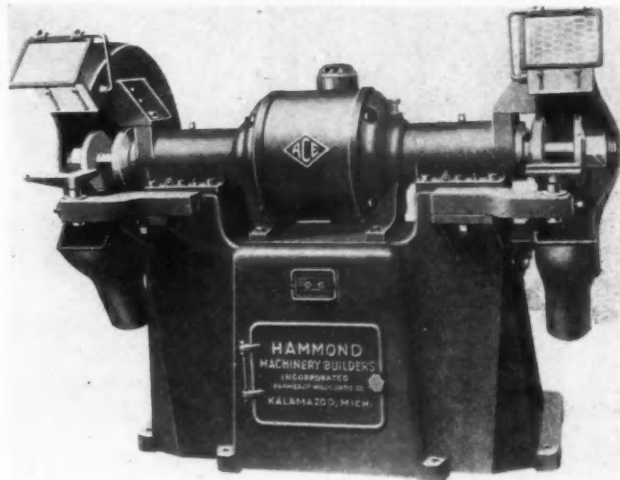
Two, four-button sets are at present available; the

No. R-1 with $\frac{3}{8}$ by 16 thread, and the No. R-2 with $\frac{1}{2}$ by 13 thread.

Ace Heavy Duty Grinder

THE Hammond Machinery Builders, Inc., Kalamazoo, Mich., announce a new series of heavy-duty floor grinders, their type "WH" in three sizes, 5, $7\frac{1}{2}$ and 10 hp.

These heavy duty floor grinders have been designed to meet the demand for power and rigidity. They are equipped with a totally inclosed motor, fitted with a patented air cleaner. The spindle is of chrome-manganese steel and is mounted on four ball bearings. An automatic motor starter having thermal overload protection and low voltage protection with push button control conveniently mounted on the pedestal is standard equipment. Approved, adjustable, steel wheel guards with hinged doors, exhaust pipe connection, adjustable spark and chip breaker and eye shield are also standard equipment. The guard is adjustable to the wear of the grinding wheel, permitting maximum work-



Ace heavy duty floor grinder

ing space with protection to operator. Grinding wheels are not regularly supplied but can be furnished to order.

These machines are available for the following ranges of current supply: 220,440,550 volt, 2 or 3 phase, 25, 40, 50 and 60 cycle, alternating current; 110, 220 and 550 volt direct current.

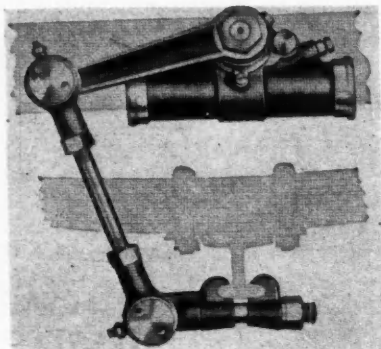
Two-Way Shock Absorber

THE Two-Way Shock Absorber Co. of Jamestown, N. Y., has announced a smaller model two-way "full-floating," hydraulic shock absorber for cars in the light and medium weight car field. This medium sized instrument is built on the same principles as the larger model, which is standard equipment on imported Isotta-Fraschini cars.

In the design of the new instrument, no return springs are used. Special provision is made for free flowing of liquid to eliminate any possibility of excessive pressures. Floating valves are provided to relieve sudden, excessive pressures which would otherwise cause stiff riding. Both the compression and the recoil of

the car springs are controlled, and the control for each direction is separably adjustable.

It is claimed that owing to the large size of reservoir employed and the fact that it is not necessary to pack the instrument against high working pressures, the fluid needs to be replenished only at long intervals.

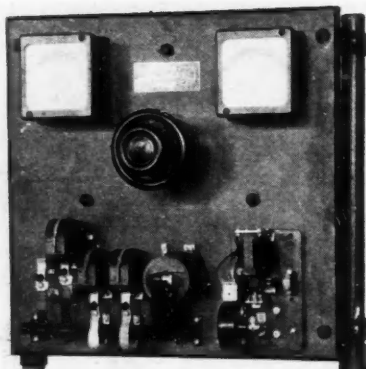


Two-Way shock absorber, medium size

The connecting arm is provided with a ball joint which is said to be self-cleaning, and to require no boot or packing washers.

G. E. Motor Starters

THE new rectangular type of meter with non-glare glass and a new type of field actuating relay are incorporated in the synchronous motor starters which



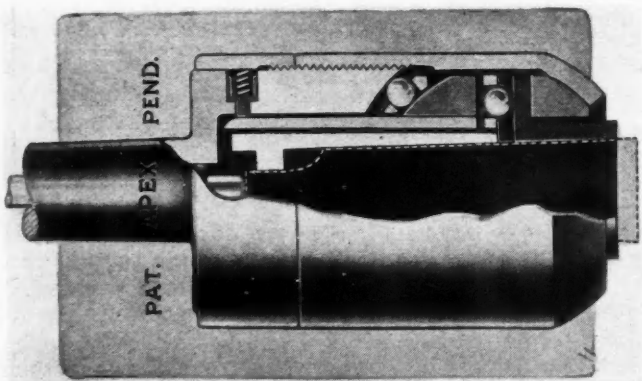
Motor starter

have just been redesigned by the General Electric Co. CR-1135 is the designation of a line of semi-magnetic, reduced-voltage starters for synchronous motors. Designation CR-7061 covers magnetic reduced-voltage starters and designation CR-7065 is assigned to magnetic full-voltage starters for synchronous motors, all

having been revised to incorporate the new devices.

Apex Floating Holders

THE design of the full and semi-floating tool holders recently brought out by the Apex Machine Co., Dayton, Ohio, is shown in photo. Angular float is obtained



Section view of Apex floating tool holder

by the upper rows of balls and parallel float by the lower rows, there being two rows at right angles in each case.

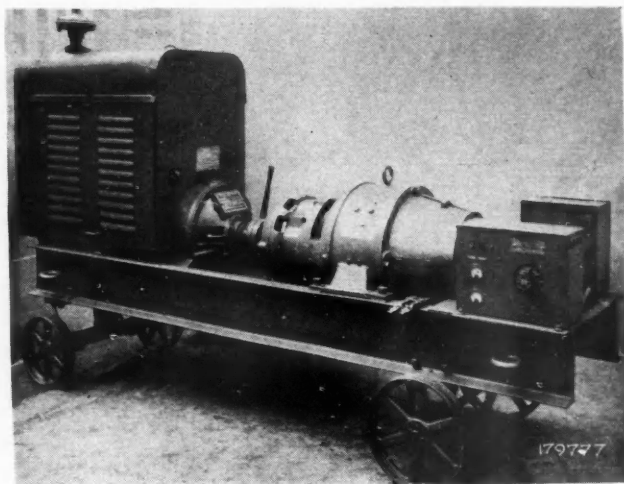
The balls operate in hardened and ground grooves, thus assuring free-floating of the tool. The semi-floating holder has only the lower row of balls.

The reamer follows the hole and makes correction for any misalignment between the work and the spindle or turret, thus eliminating bell-mouthed and tapered holes.

Dual Drive Welding Unit

A NEW Dual Drive Arc Welding Unit has been introduced by the Westinghouse Electric & Manufacturing Co.

This unit consists of a standard 300-amp., single operator welding generator; a 15 hp., alternating cur-



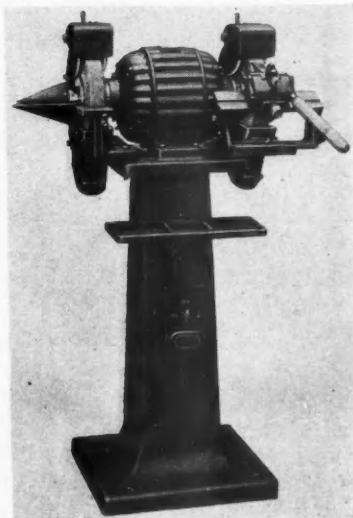
Welding unit

rent induction motor; and a six-cylinder, Model P-45 Continental gasoline engine, all mounted in tandem. The motor operates on 220 volts, but by merely reconnecting the external motor leads and changing the line-starter coil, it can be used on 440 volts. The welding generator can be driven by either the gasoline engine or the electric motor by engaging or disengaging a slip coupling or clutch.

All Purpose Grinder

THE J. G. Blount Co., Everett, Mass., has produced an all-purpose tool grinder driven by a 1 hp., 1750 r.p.m., fully inclosed, dust-proof motor, built by the Westinghouse Electric & Mfg. Co.

This grinder is provided with two wheels; a coarse wheel, 10 in. by 1½ in., for general shop use; a fine wheel of the same size is provided for the grinding of tools, chisels, plane irons, etc. This wheel is provided with a special rest, fully adjustable as to the angle with the wheel face, to which is fitted a screw-feed sliding-clamp block for holding the tool and guiding it



Blount grinder

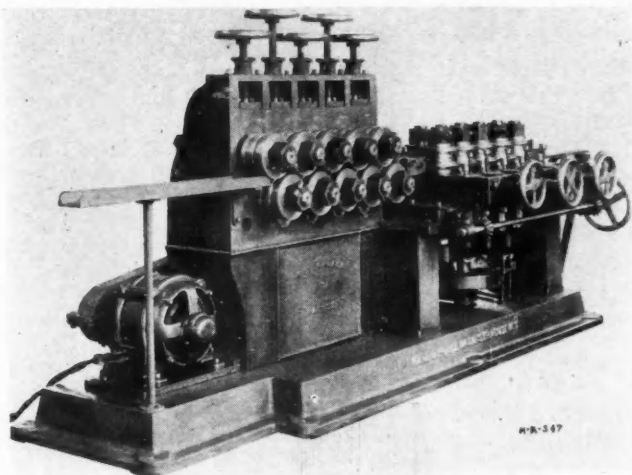
square across the wheel. For the grinding of gages and inside curved tools, a grinding cone is provided.

The spindle is extra heavy and runs in heavy duty deep groove ball bearings. Double recessing of flanges provides a double seal against grit and dust entering either the bearings or the motor. The wheels are fitted with fully-inclosing, approved safety guards, fully adjustable to wheel wear. The tool rests are also adjustable.

Roll Straighteners

COMBINATION vertical and horizontal roll straighteners in a complete line of seven sizes are offered by Kane & Roach, Inc., Syracuse, N. Y.

Roll shafts are of chrome manganese steel, accurately



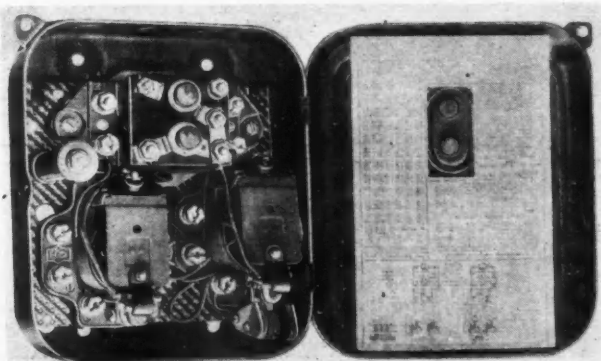
Kane & Roach straightener

ground and machined. Reduction and drive gears are of forged cut steel. Where required, heat-treated gears are used. Drive pinions are of forged steel, heat-treated and ground. Reduction and drive gears run in oil-tight gearboxes. The motor chain and sprockets are guarded by heavy cast iron guards. Another feature of these machines is Alemite pressure feed lubrication.

The rolls are designed for handling rounds, flats, tubes and a variety of special shapes. Delivery speed ranges from 60 to 300 ft. per minute.

D. C. Across-The-Line Starter

A NEW, automatic, across-the-line starter, for direct current motors up to 2 hp., 115 or 230 volts, is announced by Cutler-Hammer, Inc., Milwaukee, Wis. Two magnetic contactors designed for D.C. work, one



Automatic starter

in each side of the line, connect the motor directly across the line on starting and provide a double line break. They have renewable silver contacts and a heavy stamped frame.

The thermal overload relays are the same as those used in this company's A.C. across-the-line starters for small motors. They are of the fusible alloy type and can be adapted to any size motor by changing the heater coils. When tripped by an overload, the relays are reset by pushing a button in the cover.

Each starter is furnished with a pushbutton master switch providing three-wire control. This master switch can be mounted either in the cover of the starter, or separately. The starter with pushbuttons in the cover, is illustrated. These starters are also made without the thermal overload relays, for applications where overload protection is not required.

Flex-Disk Grinder

THE Van Dorn Electric Tool Co. of Cleveland, Ohio, has just announced a new 7-in. Flex-Disk Grinder for use in smoothing welded and soldered joints and seams, cleaning dies, smoothing metal surfaces before painting and other work requiring filing, sanding and emerying. A felt-backed abrasive disk is used for these operations.

Among improvements on the 7-in. grinder are: a removable pipe handle and right and left-hand bosses, making it possible to change the grinders quickly and easily for right or left-hand operation.

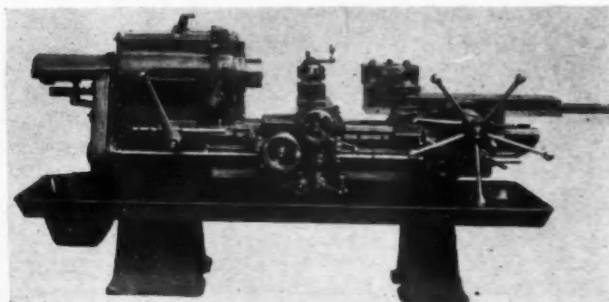


Van Dorn Flex-Disk grinder

Gisholt Turret Lathe

THE No. 4 Universal Turret Lathe, with a number of new features, is introduced by the Gisholt Machine Co., Madison, Wis.

Among the important features are: the automatically



Gisholt lathe

indexing square turret, hardened steel ways, automatic spindle brake, centrifugal lubrication of the head stock. Another innovation is the automatic clamping and release of the hexagon turret. Flexibility is provided by 12 changes in spindle speed and eight changes in feed. The motor rating is 3 hp. at 1200 r.p.m. Floor space required is 40 in. by 99 in. The net weight is 3450 lb.

News of the Industry

PAGE 698

VOLUME 61

Philadelphia, Saturday, November 9, 1929

NUMBER 19

Production Curve Levels As Low Point Seems Near

DETROIT, Nov. 9.—The seasonal downward trend in automobile production has continued during the first week in November, but the drop in the production curve, considering the industry in the United States and Canada as a whole, appears more gradual; an indication that a low level is being closely approached.

So far as actual curtailment of production is concerned, suspension of operations by a number of leading manufacturers, for the purpose of taking annual inventory during the last few weeks of the year, will probably result in further dropping off of the aggregate production.

October production was estimated at 400,000 units, for all makes, including Ford, by the National Automobile Chamber of Commerce, in figures presented at the director's meeting Thursday. This compares with production of 415,820 units for the same month last year, and 429,149 units for September of this year. Production for the first 10 months of this year was estimated as 5,271,324 units as against 4,088,691 for the corresponding period of last year.

Ford Production Announced

DETROIT, Nov. 7.—The increased production record that has been maintained by the Ford Motor Co., in comparison with previous years, continued through the month of October, according to a statement issued today. Total production of Ford cars and trucks for the month of October was 177,483. This represents an increase of 55,801 over the record for October, 1928. Production of Ford cars and trucks during the first 10 months of this year was 1,810,997.

Chevrolet Taking Stock

DETROIT, Nov. 6.—Taking of inventory is now under way at the factory of the Chevrolet Motor Co., Flint, Mich. The motor and sheet metal departments have been closed for stock checking, and operation of the assembly plant will be suspended in about a week. It is understood that the motor and sheet metal department will be reopened in about 10 days, and that operation of the assembly plant will be started shortly afterward.

Oakland to Reopen

DETROIT, Nov. 8.—Operations will be resumed in all departments of the Oakland Motor Car Co., Pontiac, Mich.,

Dornier Sees Great Future for Aircraft

BERLIN, Nov. 6.—Within the next ten years, giant seaplanes will be able to carry a useful load of more than 100 tons, Dr. Claude Dornier told the Scientific Society for Aviation here today. The future belongs to giant flying ships, if engines keep step with the developments of the fuselages and wing structures, he said.

Fifty-four trial flights overcame many obstacles which developed during early tests of the DO-X, he said.

about Nov. 12, following a general shutdown for the purpose of taking inventory, according to plant officials.

Canadians Establish Aeronautic Chamber

WASHINGTON, Nov. 6.—A newly created aeronautics organization known as the Canadian Association of Aeronautical Interest has been incorporated in Montreal with a Dominion charter, according to a report received by the Department of Commerce.

The purposes of the organization are to promote trade throughout Canada and foreign countries in the interests of corporations engaged in manufacturing, dealing and operating aircraft; to remedy abuses relative thereto; to diffuse information; to procure uniformity of trade practices; to promote enactment of equitable laws pertaining to aeronautics, and to arbitrate differences which might possibly arise between its members.

McComb is Elected President of M.E.A.

Convention Opens With Largest Exhibit of Accessories and Parts in History

CHICAGO, Nov. 7.—John M. McComb, vice-president and treasurer of the Crucible Steel Co. of America, was elected president of the Motor & Equipment Association, succeeding N. H. Boynton, at the annual meeting in session here.

M. B. Ericson, director, General Spring & Bumper Co., Detroit; George Brunner, general manager, Brunner Mfg. Co., Utica, N. Y., former secretary, and E. T. Satchell, president of Motor Accessories Co., Allentown, Pa., were named vice-presidents of Divisions A, B and C, respectively.

C. H. Burr, SKF Industries, Inc., was elected treasurer, and Charles F. Wright, of the Ballou & Wright Co., Portland, Ore., was chosen secretary. C. C. Seerist was elected assistant treasurer.

More than 4000 delegates from nearly every state in the Union and many Canadian provinces, assembled Monday for the opening session. Secretary of Commerce Robert P. Lamont followed Mr. Boynton on the program. Both expressed their belief that the industry was on a sound basis.

Other speakers were J. W. Hayes, Crowell Publishing Co.; M. L. Heminway, managing director of the M.E.A., and reports were submitted by Mr. McComb, W. S. Sherwood and E. R. Seager.

More new products were shown in the Coliseum than ever exhibited under the association's auspices, when the doors opened Monday.

George E. Quisenberry, editor of *El Automovil Americano* and secretary of the Overseas Automobile Club, addressed the export meeting of the association Wednesday. He said that he believed high tariff rates would injure industry abroad.



John M. McComb
New President
M. & E. A.

G.M. Balance Sheet Shows Rise in Cash

Current Assets Decrease Compared With 1928 Statement

NEW YORK, Nov. 6—General Motors Corp. earnings for the nine months ended Sept. 30 of \$222,848,335, or \$4.96 a share, on common stock resulted from the sales by manufacturing divisions to dealers of 1,675,964 cars, according to letter to stockholders mailed by Alfred P. Sloan, Jr., president, today.

The consolidated advanced balance sheet as of Sept. 30 shows current assets of \$446,271,429 as against current liabilities of \$135,180,818. This compares with current assets of Dec. 31, 1928, of \$468,809,287 as compared with current liabilities of \$173,002,983.

The report also shows cash of \$115,462,552 as against \$99,189,839 on Dec. 31 and government and negotiable securities of \$72,190,521 as compared with \$116,715,391 on Dec. 31.

Canadian Tariff Hearing is Set for December 12

WASHINGTON, Nov. 6—Hearings on the tariff regarding automobiles and motor trucks, including engines and parts, will be held on Dec. 12 by the Canadian Advisory Board on Tariff and Taxation at Ottawa, according to a cablegram received by the Department of Commerce. These hearings will be the last of a series to be begun on Nov. 26 on iron and steel products and finished lines, such as agricultural machinery, hardware and railroad rolling stock. The hearings will, in accordance with instructions from the Minister of Finance, cover all items bearing upon the iron and steel industry of Canada, including a review of the various applications for duty changes.

The Minister of Finance has instructed the board to investigate relative prices of automobiles in Canada and in the United States, as well as the percentage of Canadian material and labor used in each model, upon which the Canadian makers are now claiming exemption from excise tax. The Dec. 12 hearing will embrace an application by a Canadian company for reduced duty on axles, bolts, shafts, radiators, and other parts for motor trucks.

Aero Signal Body Named

WASHINGTON, Nov. 6—Realizing that there exists an urgent need for the development of standard signal systems, suitable for both day and night use, for controlling air traffic on and in the vicinity of airports and for communicating special information to pilots, Clarence M. Young, assistant secretary of commerce for aeronautics, has just announced the organization of a special research committee to study such systems.

The committee follows: Charles H. Helms, National Advisory Committee for Aeronautics; Lieut. Newton Longfellow, Army Air Corps, War Department; James Murray, Aeronautical Chamber of Commerce; Commander F. D. Wagner, Bureau of Aeronautics, Navy Department; Col. Harry H. Blee, chairman, Aeronautics Branch, Department of Commerce; Capt. F. C. Hingsburg, Airways Division, Bureau of Lighthouses, Department of Commerce; Dr. J. Franklin Meyer, Bureau of Standards, Department of Commerce; A. Pendleton Taliaferro, Jr., secretary, Aeronautics Branch, Department of Commerce.

Stearns Motor Mfg. Co. Reported in Receivership

GRAND RAPIDS, MICH., Nov. 7—The Stearns Motor Mfg. Co., of Ludington, Mich., has gone into voluntary receivership to J. W. Beiger, of Ludington, on the petition of Rogers Brown and Crocker Bros., Inc., of Wilmington, Del., and proceedings have been begun in the district court, according to an Associated Press dispatch.

The petitioners are creditors in the amount of \$4,493, and the petition states that if the company is permitted to operate under a receivership to complete \$100,000 in orders on hand and in process, and assets are liquidated, all obligations can be met, the dispatch says.

Franklin County Sales Drop

COLUMBUS, Nov. 4—Total sales of passenger cars in Franklin county during the month of October were 993, which is a slight decline over September, in which 1115 sales were recorded. Sales of trucks during the month totaled 184. The Chevrolet has taken first place in the list of passenger cars with 291, while Ford was second with 276; De Soto was third with 49; Chrysler fourth with 42; Essex fifth with 36; Buick sixth with 34 and Oldsmobile seventh with 31.

Gear Companies Merge

DETROIT, Nov. 4—The Republic Gear Co. has purchased all of the capital stock of the Accurate Gear Co., Springfield, Ohio, to effect a merger of the two companies, according to an announcement made by the latter company.

N.A.P.A. Officers Elected at Exhibit

C. E. Hamilton Heads Manufacturers' Advisory Committee

DETROIT, Nov. 7—Officers of the National Automotive Parts Association elected at the opening of the fifth annual convention and exhibition of the organization, which opened yesterday and will close tomorrow night, are as follows: H. G. Root, Automotive Parts Co., Columbus, Ohio, president; W. W. Martin, Superior Motor Parts Co., Pittsburgh, vice-president. Other members of the board of directors are: A. F. Baxter, Unit Parts Corp., Buffalo; R. W. Boozer, Central Motor Parts Co., Indianapolis; J. A. Aff, Quaker City Motor Parts Co., Pittsburgh; Norman Devitt, National Automotive Parts, Ltd., Toronto, and G. W. Richardson, Standardized Parts Corp., Memphis.

C. E. Hamilton, Automotive Gear Works, was elected chairman of the manufacturers' advisory board to succeed D. A. Andrews of Continental Motors Corp., who resigned as chairman, but remains a member of the board. J. B. Childs, of the Spencer Mfg. Co., was elected vice-chairman, while the other member of this board is C. C. Blanchard, Borg & Beck Co. Charles H. Davis and Frank M. Harrington were reelected to the offices of secretary and director of merchandising respectively.

The international warehouse group, United States and Canada, reported an increase in sales of 18 per cent for the year ending Sept. 30.

Chevrolet End of October Sales Reported High

DETROIT, Nov. 7—Sales of the Chevrolet Motor Co., in the last 10 days of October shows a 49 per cent increase over the same period last year, figures for the period this year are 36,640 against 24,539 last year, according to officials of the company.

Gains over last year's levels were made in all parts of the country, a majority of the company's 52 sales zones surpassing their quotas. November sales are reported as continuing along the same high level.

Factories Report October Production

| Company | October, 1929 | September 1929 | 10 Mos., 1929 | 10 Mos., 1928 | Total, 1928 | November Schedule |
|-------------------|---------------|----------------|---------------|---------------|-------------|-------------------|
| Auburn | 1,251 | 1,856 | 21,972 | 11,849 | 13,481 | 1,500 |
| Buick | 20,582 | ..... | ..... | ..... | ..... | ..... |
| Cadillac-La Salle | 5,150 | ..... | ..... | ..... | ..... | ..... |
| Chevrolet | 85,891 | ..... | 1,276,115 | 1,165,774 | ..... | ..... |
| Franklin | 800 | 1,028 | 13,092 | 6,604 | 7,769 | ..... |
| Gardner | 302 | 250 | ..... | ..... | ..... | ..... |
| Graham-Paige | 3,263 | ..... | 74,948 | 70,401 | 13,195 | ..... |
| Hupp | 5,654 | 8,584 | ..... | ..... | ..... | ..... |
| Olds | 4,994 | ..... | 10,837 | ..... | ..... | ..... |
| Reo | 2,087 | ..... | ..... | ..... | ..... | ..... |

Flexibility of Ford Organization Seen as Permitting Rapid Changes in Models

DETROIT, Nov. 5—"Is Ford to bring out a six? Is Ford developing an eight? Are Ford plants shutting down for model changes? Is Ford to bring out new cars?" It takes one back to the days of 1927 and 1928 just before the production was stopped on the Model T and while the Model A was under development. Are 15,000,000 cars of one kind, then, no longer possible?

When the Model A was introduced there began long drawn out speculations as to just how long Ford would be able to continue his new model without major changes and not feel the effect of competition—as he finally did on the Model T. Those who claimed that Ford would definitely join the "yearly model" group—which now comprises almost the entire remainder of the industry, whether the companies admit it or not—now seem to have the edge.

Rumors indicate that the Ford Model A is about to be modified once more in some respects. Since the introduction of the Model A, monthly changes have been the order of things at the Ford plant. As a result very little is perhaps required from a mechanical point of view. It is alleged that a rubber engine mounting is under development, but whether or not it will be adopted cannot be definitely stated. If it were, it would result in elimination of transmission of some of the engine vibration to the chassis and body.

Mostly, however, the changes are supposed to concern themselves with the bodies. While it is rumored that wheel-base will remain unchanged, as far as present plans are concerned, bodies may be longer. Comfort and appearance of the Model A, while hardly open to severe criticism when the price is considered, are in many circles regarded as lagging behind the mechanical abilities of the car.

Longer bodies would help considerably in these directions, since they would undoubtedly provide more leg room. Such new bodies would also prove to be decidedly more pleasing

with their better streamlining and better balance, for with the increased body size, it is alleged, there have been scheduled new radiators, higher and narrower in outline, and a hood whose proportions are more in keeping with the "larger car effect" the changes should produce. The hood itself, it is rumored, is to be faired into the body in a manner similar to that on the present four-door sedan, so that it would be on the two-door, coupe and open models that the greatest difference would be apparent. New fenders are said to have been developed, these being more sweeping in general lines.

It is also definitely known that Ford is changing to a smaller type of wheel, 19 in. in diameter, as against 21 in., with the tire section increased to 4.75 in. from 4.50 in. This change is also effective in lowering the overall height $\frac{1}{2}$ in.

The question then is: When are the changes to be made? Here the signs again point toward December. Ford dealer stocks have been well up for some time. Immediate delivery can be obtained on practically every model in any part of the country.

Further production cuts in conformance with sales decreases during the winter months would mean the laying off of rapidly increasing proportions of employees. It is possible that the Ford Motor Co. has therefore been maintaining its high production schedules in order to be assured of sufficient dealer stocks of cars while changes are being made. That a total shutdown of nearly the entire plant will be necessary, even if only for a few weeks, appears almost inevitable when the various factors are taken into consideration.

Changes in Ford plans, however, are so frequently made at a moment's notice, that it is always difficult to predict this company's plans for even a month ahead. From this point of view, the Ford Motor Co.'s one-man organization provides a flexibility that is not duplicated in any other automobile plant of any size.

Marmon Announces Prices on New Big Eight Series

INDIANAPOLIS, Nov. 4—Prices of the new Marmon Big Eight are announced by Thomas E. Jarrard, general sales director of the Marmon Motor Car Company, coincident with first shipments of the new car from the factory. These prices, which are f.o.b. factory, Indianapolis, are as follows:

| | |
|-------------------------------------|---------|
| Five-Pass. Sedan | \$2,695 |
| Seven-Pass. Sedan | 2,895 |
| Four-Pass. Four-Door Club Sedan... | 2,745 |
| Four-Pass. Four-Door Brougham..... | 2,745 |
| Two-Pass. Coupe with Rumble Seat... | 2,745 |
| Seven-Pass. Limousine | 2,995 |
| Chassis | 2,250 |

These prices include two-way hydraulic shock absorbers, bumpers front and rear, trunk racks, and wood wheels with two spare rims mounted forward.

Gilmer Co. Buys Farran-oid

PHILADELPHIA, Nov. 4—The L. H. Gilmer Co. has announced the outright purchase of the Farran-oid Co., of Akron, Ohio, organization changes to be made as of Nov. 1. In announcing the purchase, John H. Krauss, president of the L. H. Gilmer Co., said:

"In purchasing Farran-oid it is not the intention of the Gilmer Co. to make changes in either the Farran-oid line or the Gilmer line."

Business in Brief

Written by the Guaranty Trust
Co., New York, exclusively for
AUTOMOTIVE INDUSTRIES.

NEW YORK, Nov. 7—Despite the further break in the stock market last week, business is generally conceded to be on a sound basis. Some industries were slightly less active; but commercial failures declined, and money was cheap. Heavy buying of steel is reported.

DEPARTMENT STORE SALES

Department store sales in the New York Federal Reserve District during September were 5 per cent above those in the corresponding period last year; and, although sales of store chains in that district during September were above those a year ago, the increase was the smallest since April of the current year.

CRUDE OIL PRODUCTION

Average daily crude oil production for the week ended Oct. 26 was estimated at 2,869,700 bbl., as compared with 2,903,200 bbl. for the preceding week and 2,523,700 bbl. a year ago.

FREIGHT CAR LOADINGS

Railway freight loadings for the week ended Oct. 19 totaled 1,185,510 cars, which marks an increase of 22,375 cars over those in the corresponding week last year and an increase of 56,455 cars over those in the corresponding week two years ago.

FISHER'S INDEX

Prof. Fisher's index of wholesale commodity prices for the week ended Nov. 2 stood at 93.7, the lowest for the current year, as compared with 94.1 the week before and 94.6 two weeks before.

STOCK MARKET

At the beginning of last week, an overwhelming amount of selling orders was thrown on the market, precipitating the severest decline in the history of the stock market. On Tuesday the record number of 16,410,030 shares were sold. Some recovery followed, but the vast majority of issues closed with appreciable net losses for the week. The New York Stock Exchange closed Thursday morning, Friday and Saturday to permit brokers to entangle the huge amount of clerical work that had piled up during the smash.

FEDERAL RESERVE STATEMENT

The consolidated statement of the Federal Reserve banks for the week ended Oct. 30 showed increases of \$194,700,000 in holdings of discounted bills, of \$157,000,000 in holdings of government securities, and of \$273,500,000 in member bank reserve deposits, while there was a decrease of \$39,500,000 in holdings of bills bought in the open market. Holdings of discounted bills in the New York district alone increased \$139,000,000, which is not surprising in view of the fact that total brokers' loans in New York City decreased \$1,096,000,000, while those placed by New York banks for their own account increased over \$2,000,000,000.

Coal is Ultimate Fuel, Says Chemist

Bureau of Mines Official Tells of Processes of Using Bituminous

WASHINGTON, Nov. 7.—According to C. A. Fieldner, chief chemist of the Bureau of Mines, coal must ultimately be the source of gasoline and other motor fuels, as it is evident that the world's supply of crude petroleum, which is now the source of liquid fuels, will be depleted within a few generations.

Mr. Fieldner outlined three processes by which motor fuels can be obtained from coal, viz.: the hydrogenating process, exemplified by the process of Dr. Friedrich Bergius of Germany, which is controlled by the Standard Oil Co. of New Jersey in this country; the high-temperature carbonization process or coking process, by which 3 gal. of motor benzol can be obtained from a ton of coal; and the low-temperature carbonization process, which yields three times as much coal tar as the high-temperature carbonization process. The tar can be converted into motor fuel with a yield of 25 per cent.

About a decade ago it looked as though the world's petroleum sources would be exhausted by about 1942 or 1943, but new sources have been discovered since that time, with the result that so far as can be seen now the petroleum supplies will last at least till 1952 or 1953.

When prices of gasoline begin to rise and a pinch starts to be felt because of the diminishing supply of petroleum, it is likely that gasoline from coal will be produced at first only as a by-product, and then later, perhaps, as a primary product, Mr. Fieldner asserted.

European Races Approved By International Group

PARIS, Oct. 30 (Special).—Twenty-two races and competitions recognized as international and taking precedence over all others have been approved for next year by the International Sporting Commission at its meeting just held in Paris. The list is as follows:

- March 1-15—Speed trials at Daytona, Fla.
- April 13—Thousand miles road race, Italy.
- April 13—Monaco Grand Prix, open race through streets of Monte Carlo.
- April 13—Morocco Grand Prix.
- May 4—Targa Florio, open road race, Palermo, Sicily.
- May 25—Rome Grand Prix.
- May 30—Indianapolis 500-mile race.
- June 15—Lyons Grand Prix.
- June 21-22—Le Mans 24-hr. road race.
- May 29—Marne Grand Prix.
- July 5-6—Belgian Grand Prix 24-hr. road race.
- July 13—German Grand Prix, sports type cars.
- July 20—European Grand Prix, fuel consumption race, Liege, Belgium.

- July 25—San Sebastian Grand Prix.
- July 27—Spanish Grand Prix, San Sebastian, sports type cars.
- July 30-Aug. 4—Alpine Trials, Germany, Austria, Italy and Switzerland.
- Aug. 17—Comminges Grand Prix.
- Aug. 30—British Tourist Trophy race.
- Sept. 7—Italian Grand Prix, Monza track, Italy.
- Sept. 14—Paved Roads race, Lille, France.
- Sept. 21—French Grand Prix, fuel consumption race, Pau, France.
- Sept. 21—Speed trials at Cremona, Italy.

Transfer of Gasoline Revenue is Approved

TOPEKA, Nov. 6.—Funds in the Kansas State treasury, collected from the gasoline tax and belonging to the counties under the apportionment provisions of the State highway law, may be transferred to the highway construction fund when not needed for immediate refund to the counties, according to a ruling issued by Attorney General William A. Smith.

The State highway law enacted by the 1929 legislature set aside the sum of \$800,000 quarterly from the gas tax and automobile license fees for apportionment to the counties on a pro rata basis, to be used for construction and maintenance of county and township roads.

Hansa-Lloydwerke Ownership Changes

BERLIN, Oct. 26 (Special).—The owners of the Goliath-Werke of Bremen, Messrs. Borgward and Tecklenborg, acquired from a bank a block of shares of the Hansa-Lloydwerke A. G. of Bremen, constituting the majority and therewith assumed control over the company, which is well known as a producer of express trucks, buses, coaches as also of electric carts and an 8-cylinder pleasure car.

Geheimrat Dr. Allmers, the chief of the company and president of the Association of the Automobile Industry in Germany, as also Herr Meyer, manager of the company, have retired from their posts. The owners of the Goliath-Werke have taken their places. The Goliath-Werke make light delivery cars, which are very popular in Germany. The two works will remain independent of one another, but the program of production will be revised.

Gardner Griffin Announced

ST. LOUIS, Nov. 6.—The Gardner Motor Co., Inc., will show the Griffin, a new front-wheel drive car, at the New York National Automobile Show, Jan. 4 to 11, it has been announced.

New Ford Price Reduction Analysis Shows Some Models Higher Than When Introduced

| Model | Dec. 1927 | 1928 | | 1929 | | New Price |
|------------------|-----------|-------|-------|------|-------|-----------|
| | | May | Sept. | Jan. | Feb. | |
| Tudor | \$495 | \$495 | ... | ... | \$525 | \$500 |
| Fordor—2-window | 545 | 570 | 625 | ... | 625 | 600 |
| Fordor—3-window | ... | ... | ... | ... | 650 | 625 |
| Roadster | 350 | 385 | ... | 450 | ... | 435 |
| Phaeton | 380 | 395 | ... | 460 | ... | 440 |
| Sport Coupe | ... | 550 | ... | ... | ... | 530 |
| Business Coupe | 485 | 495 | ... | ... | 525 | 490 |
| Pick-up Roadster | 381 | 395 | ... | ... | ... | 445 |
| Chassis | 300 | 325 | ... | ... | ... | 365 |
| Truck Chassis | 375 | 460 | ... | ... | ... | 540 |
| Standard Coupe | ... | ... | 550 | ... | ... | 500 |
| Sport Cab. | ... | ... | ... | 670 | ... | 645 |
| Town Sedan | ... | ... | ... | 695 | ... | 670 |
| Town Car | ... | ... | ... | 1400 | ... | 1200 |
| Station Wagon | ... | ... | ... | 695 | ... | 650 |
| Taxicab | ... | ... | ... | 800 | ... | 725 |
| Rumble Roadster | ... | ... | ... | ... | 485 | 470 |
| A Panel Del. | ... | ... | ... | ... | ... | 615 |
| AA Panel Del. | ... | ... | ... | ... | ... | 850 |

DETROIT, Nov. 4.—The reductions in list prices, f.o.b. Detroit, which were announced Nov. 1 in a statement issued by Edsel B. Ford, president of the Ford Motor Co., brings prices back to approximately where they were before increases were announced in the early months of this year in the cases of several body models. From the accompanying table it will be seen that present prices are higher than corresponding prices in the Model T line and that in most cases they exceed the original prices listed when the Model A was introduced.

The statement issued by Edsel B. Ford, president of the Ford Motor Co., in connection with the price reduction Nov. 1, follows:

"We are announcing today a substantial reduction in the prices of Ford cars and trucks.

"It is our belief that basically the industry and business of the country are sound. Every indication is that general conditions will remain prosperous.

"We are reducing prices now because we feel that such a step is the best contribution that can be made to assure a continuation of good business throughout the country. Our dealers are assisting in the move by accepting a reduction in their discounts.

"It has always been the policy of this company to pass on to the public as rapidly as possible the advantages of quantity production and newly developed manufacturing efficiencies."

Man Power Replaced by Motor Transport

Automotive Units Take Place
of Human Backs, Trade
Group is Told

CLEVELAND, Nov. 6—The human back, as a transport, has given way to five-ton trucks in South America, and tractors have been added to the modern method of land cultivation, Wallace J. Thompson, New York, editor of *Ingenieria Internacional*, told 300 export men at the foreign trade conference of the Chamber of Commerce here. Peons, accustomed to wheelbarrows, see their sons operating steam shovels, he said.

Grosvenore Jones, of the United States Bureau of Foreign and Domestic Commerce, warned against extending credits in Cuba, Brazil, Colombia, Bolivia and Central America at this time. Low sugar prices, tremendous coffee supplies and cheap tin have lowered credit standards in these countries, he said.

Mr. Jones said he saw no cause for alarm in the invasion of this country by foreign manufacturers. If the German Opel plant of General Motors and the Ford plant at Cork, Ireland, go into heavy production, the Latin American

export field would find competition, however, he pointed out.

E. W. Fend, export manager of the Willard Storage Battery Co., and H. J. Leisenheimer, export manager of the Cleveland Tractor Co., led a round-table discussion on "Direct Selling."

G. M. Buys Land

DETROIT, Nov. 6—The General Motors Corp. has purchased a piece of property 220 ft. by 800 ft. adjoining the plant of the Chevrolet Motor Co. at Bay City, Mich., according to an Associated Press dispatch. No announcement was forthcoming from Chevrolet officials concerning any plans for construction on the property.

C.I.T. Gets Marmon Contract

INDIANAPOLIS, Nov. 5—The Marmon Motor Car Co. has made arrangements with the Commercial Investment Trust Corp. for the handling of wholesale and retail financing of Marmon cars outside of continental United States and Canada, according to an announcement by C. J. Sherer, vice-president and treasurer of the Marmon company.

To Make Gliders

DETROIT, Nov. 4—The Detroit plant of the Detroit Aircraft Corp., now manufacturing the Eastman Flying Boat, will soon be producing primary gliders.

Latin American Highway Development Cited by Delegates to Rio de Janeiro Conference

NEW YORK, Nov. 6—Latin America is developing its roads rapidly along lines developed in the United States, and has come to a definite realization of the social and economic value of a proper highway development program, according to J. Walter Drake, chairman of the American delegation to the second Pan-American Highway Conference held last August in Rio de Janeiro, who returned today with the rest of the delegation aboard the S.S. Western World. Since the first conference five years ago, rapid strides have been made in actual accomplishment of the programs outlined then, and it was possible to devote this year's meeting to a discussion of the broader programs of the highway problem.

The Latin American countries have started their road development along lines of immediate need, instead of attempting to establish highways from boundary to boundary without consideration of the relative importance of communities served, but the question of inter-American highways is also being seriously considered and this will doubtless develop by the junction of roads now in construction and already developed. Present road-building programs are being fitted to the needs of the communities served and range from foot paths joining smaller communities to the finer paved roads with which we are familiar. The importance of high-

way development in these countries is evidenced by the fact that traffic opens on all these roads as soon as they are constructed.

Some of the drawbacks still being faced in these countries are lack of adequate Federal aid in some of even the larger South American countries, neglect of proper maintenance programs which are not receiving sufficient emphasis in the face of the large building programs, and the continuing tendency to build railroads without adequate consideration of the purposes to be served.

"Truck development has naturally come very rapidly in regions where there is little or no other transportation and as the roads are extended there is certain to be a great economic development in rich portions of South America which are still but little known to trade," added Thomas H. MacDonald, chief of the United States Bureau of Public Roads, who was also a member of the delegation.

Others who returned with the delegation were H. H. Rice and Pyke Johnson, representing the National Automobile Chamber of Commerce; George Goergens of the U. S. Department of Agriculture; Wyatt Pickens of the University of Louisiana, and Karl Miller of the *Detroit News*. The next conference is to be held in Santiago, Chile, in 1932.

N.S.P.A. Officials Predict Record Show

Number of Exhibits Increased
and Features
Added

DETROIT, Nov. 7—The annual show and convention of the National Standard Parts Assn., which will be held from Nov. 11 to 15 inclusive at Convention Hall here, will be the largest event ever held by the organization, according to officials. This year's event will house 350 booths of 225 exhibitors and will occupy about 100,000 sq. ft. of floor space.

The exposition held last year in the public auditorium at Cleveland contained 227 booths of 188 exhibitors and occupied 60,000 sq. ft. Registrations, including delegates from all parts of the United States, Canada and 10 foreign countries, are expected to exceed 7000 persons. Registrations at last year's event were about 4500.

Stout Air Lines, Inc., will operate special lines from Chicago and Cleveland for this year's convention and special trains will run from Chicago and New York to this city. Monday night 100 overseas guests will be given a dinner at the Book-Cadillac Hotel.

An idea of the growth of the annual event of the organization may be obtained from reviewing the first show and convention, which was held at the Sherman Hotel, Chicago, in 1925. At this event 55 exhibitors occupied 65 booths and 10,000 sq. ft. of floor space was used.

French Adopt Legislation for Stronger Headlights

WASHINGTON, Nov. 6—Effective Jan. 1, 1930, all new automobiles in France must be equipped with lights that illuminate the road clearly for 100 meters (approximately 398 ft.) but which can be made non-glaring, according to reports received by the Department of Commerce.

A special commission is to be appointed to examine all lights when a model has been approved. All equipment of such a model will bear the official stamp of approval when it leaves the manufacturer.

In order that the required two sets of brakes in the future will be "effective and independent" a forthcoming decree from the Ministries of Public Works will specify the conditions. Requirements of the decree, however, will be applicable only to new types as submitted for approval, and will not affect those brakes already in use or on types already approved.

Brussel is Promoted

John W. Brussel, assistant factory manager of the Timken-Detroit Axle Co. plant in Detroit, has been promoted to the position of factory manager.

Light Orders Force Mills to Shut Down

Steel Plants Prune Operations
As Buying Drops; No
Cancellations Seen

NEW YORK, Nov. 7.—Steel-finishing mills, catering to automotive consumers, are making the best of the very light demand. Some mills are resorting to intermittent shut-downs and others have further pruned their operating schedules to make their scant backlogs last longer. In one respect steel has fared much better in the recent stock market upheaval than was the case in similar upsets of the past.

Formerly, when a drastic slump overtook the stock market, steel company executives would find on their desks on the morning after, any number of requests for postponement of shipments or out-and-out cancellations. Not a single incident of this sort came to light this week, so that by test orders for steel have now become irrevocable.

Of course, the volume of business on steel mills' books was relatively light when the "bears" first succeeded in their raid on stock market prices, but nevertheless the steel market looks upon the utter absence of any untoward effect on commitments as a decidedly constructive factor.

As for steel prices, it may be said that there has been so far an insufficiency of business to test their endurance.

Under prevailing conditions it is only natural that worthwhile buyers are accorded every possible consideration. In some cases this takes the form of minor price concessions, but there has been no out-and-out downward revision of prices anywhere along the line.

Sheet and strip rolling capacity has been considerably increased this year, and intensive competition among mills is looked for at the first sign of automotive buyers entering the market for their first quarter 1930 requirements. Meanwhile the market is marking time.

Pig Iron—Automotive foundries are taking iron only as they need it. The Michigan price for foundry continues at \$19.50, furnace, with malleable usually quoted at \$20. The Valley pig iron market is dull, foundry being quoted at \$18.50 and malleable at \$19, furnace.

Aluminum—The market is very quiet, what little demand there is being of retail proportions. Some business is pending, with prospective buyers of secondary metal doing considerable shopping. The London market for both English and foreign virgin metal is at the equivalent of 21 cents.

Copper—Quite a little metal is reported to have been offered in London at prices below those of the American producers. The market here remains quothably unchanged and quiet.

Tin—At the opening of the week tin declined to 40½ cents for spot Straits, a new low for the year. Consuming demand is very light.

Lead—The market has steadied, demand being fair.

Blue Leads Green in Color of Cars

WILMINGTON, DEL., Nov. 6—Blue, brown and green are the most popular automobile colors, according to the Duco color chart for the fall. Green, blue and grey led last year, according to E. I. du Pont de Nemours & Co. It was pointed out that colors at the London International Motor Show were more conservative than those in the Paris Salon.

A.S.M.E. Plans Include Tour

NEW YORK, Nov. 5.—In connection with the fiftieth anniversary celebration of the American Society of Mechanical Engineers, western members of the organization will board a special train at Salt Lake City and be conducted on a tour of interesting cities and natural wonders in the East. The land tour will end at Norfolk, from which point the trip will be continued to New York by water.

Engineer Should be Able to Design Car for Predetermined Price, Says Downey

DETROIT, Nov. 5.—"The real measuring stick of an engineer today is his ability to design the best car possible for a predetermined price class," Col. A. C. Downey, purchasing manager, Chrysler Corp., stated at a meeting of the Detroit Section, Society of Automotive Engineers, last night. Continuing, he said: "Practically every car nowadays is designed to a price, or rather a price class, and the main thing that is required of an engineer is that he design the car for that class, that it be outstanding over competition, and still leave a good profit for the company."

"Engineering for Economy," the title of Col. Downey's address, also led him into a discussion of "model changes." "A model change," Col. Downey stated, "in my opinion is justified only to give the public a completely new automobile at a better price. Most of the model changes we have today are merely alterations in body design and tinware. This is not economical, and moreover, the public doesn't want it. It is conservative. It doesn't buy new houses every year. For true economy an engineer should at least be able to design an automobile that will last for two years. Moreover, the public doesn't want knick-knacks, and the real volume of the future, as at present, is going to be obtained by builders of moderate-priced automobiles without all this unnecessary material."

As to engineering changes in production, Mr. Downey expressed himself of the opinion that we would always have

Trans-Canada Road Progress Reported

WASHINGTON, Nov. 6.—Contracts have been made by the Manitoba government for the work of clearing the final stretch in Manitoba on the Trans-Canada highway, according to a report received from Consul Ray Fox, made public by the Department of Commerce. The last unopened stretch is a distance of about 44 miles from White-mouth to the Ontario boundary through brush country. The right of way will be cleared 99 ft. wide and about 100 men will be engaged on the job.

The cost of finally completing the 44-mile extension into all-weather graveled highway is estimated at about \$550,000 and at the last session of the Manitoba legislature \$200,000 was appropriated for this year's program. With similar operations being conducted by the Ontario government from Kenora to the Ontario boundary, officials of the Manitoba Department of Highways expect Trans-Canada highway to be completed to Kenora by the fall of 1930.

them with us, but that the future would see a material reduction in their number, and the cost which they involve. Art departments in automobile companies, Mr. Downey felt, have rather missed their functions up to the present. "We now have a full-fledged art department in our corporation," he said, "but as far as I can see, they spend about 99 per cent of their time in designing louvers."

Preceding the dinner meeting, Hilton G. Freeland, metallurgical engineer, Ludlum Steel Co., presented a paper on "Nitalloy." Some of the interesting facts brought out by Mr. Freeland were that parts should not be machined or ground to any depth after nitriding, as the surface hardness is then materially reduced, that in the machining of nitalloy parts before nitriding more acute angles of cut and higher speeds should be used than with other alloys of similar hardness and strength, and that it is absolutely essential to remove all decarburized metal from the part to be nitrided. One company, Mr. Freeland stated, has experimentally produced complete crankshafts of nitrided nitalloy with such successful results that they may soon be put into production.

Mr. Freeland felt that, as the result of further experimenting and the accumulation of greater knowledge, time of nitriding can be materially reduced. The application of nitriding to other steels has not worked out satisfactorily as yet, Mr. Freeland stated in answer to a question by Mr. Shoemaker.

Men of the Industry and What They Are Doing

E. J. Connolly Elected Vice-President of Hayes

E. J. Connolly has been elected vice-president in charge of manufacturing of the Hayes Body Corp., of Grand Rapids, Mich., and has been elected to the board of directors. A. A. Ginsburg, vice-president and general manager, has resigned. Mr. Connolly until his present appointment has been in charge of the Indianapolis division of the company. He joined the Hayes organization two years ago. Previously he was vice-president in charge of manufacturing of the Murray Body Corp., with which company he was associated for 14 years. Mr. Ginsburg has made no announcement of his plans for the future.

Rowland Succeeds Mattmore

R. M. Rowland has been appointed director of advertising, and John H. Caron, assistant director of advertising of the Chrysler Sales Corp., according to an announcement by J. W. Frazer, sales manager. W. J. Mattmore, who served for a number of years as director of advertising, has resigned to return to the advertising agency field.

Loranger Made Supervisor

Packard Motor Car Company has announced that J. W. Loranger, formerly supervisor of district managers, has been appointed general supervisor of wholesale sales. He is succeeded as supervisor of district managers by P. B. Wishart, formerly district manager.

DeLargey is Promoted

F. L. DeLargey, formerly purchasing agent of the Wilcox-Products Division of the Wilcox-Rich Corporation, has been appointed supervisor of purchases of all divisions, it has been announced. Mr. DeLargey's headquarters will continue to be in Saginaw, Mich.

Thoms Heads Lamp Sales

William F. Thoms, vice-president of the Allied Products Corp., has been appointed to head sales in the Indiana Lamp division of the corporation. He will be assisted by L. P. Chittenden.

McManus Joins St. Louis Aircraft

A. E. McManus has been appointed assistant to the president of the St. Louis Aircraft Corp. He was formerly connected with the Culver City Airport Corp.

Rubber Executives Honored

Officials of the United States Rubber Co. were honor guests at a dinner given by the Detroit Board of Commerce recently in recognition of the concentration of the company's tire manufactur-



L. J. Hannah

whose appointment as director of sales development of the De Soto Motor Corp. was announced this week

ing in Detroit. F. B. Davis, Jr., president and chairman of the board of the Rubber company, and Earnest Hopkinson, vice-president, were among the speakers. The committee in charge was headed by Mayor John C. Lodge and included Roy D. Chapin, A. R. Glancy, F. J. Haynes, Alvan Macauley, C. S. Mott, a vice-president of General Motors, and M. L. Pulcher, president Federal Motors Truck Co.

Heldt Talks to S.A.E.

MILWAUKEE, Nov. 6 — At the monthly meeting of the Milwaukee Section of the S.A.E., held here this evening, a paper on Front-Wheel Drives was presented by P. M. Heldt, engineering editor of *Automotive Industries*. The author dealt with the subject from a critical angle, explaining why the rear-wheel drive was adopted in the first place and why engineers are now looking toward the front drive as a possible solution of some of the problems confronting them.

Blackinton Joins Sullivan

G. W. Blackinton, who resigned as factory manager for the Continental Motors Corp. plant in Detroit, has re-identified himself with the Sullivan Machinery Co. of Chicago, with which he was connected from 1906 to 1917.

Heads Kari-Keen Aircraft

Ryal Miller, Sioux City, Iowa, has been elected president of the Kari-Keen Aircraft Co., succeeding Dr. B. H. Sprague.

New Sales Supervisors Appointed by Marmon

Thomas E. Jarrard, general sales director of the Marmon Motor Car Co., has announced the division of the United States into four sales divisions, each under a field supervisor.

The four field supervisors and the sections each will cover are: J. W. Hawk, Pacific Inter-Mountain section, headquarters at Oakland; J. W. DeBow, Great Lakes section, headquarters at Indianapolis; J. O. Smith, Southern section, headquarters at Birmingham, Ala., and George C. Tenney, Atlantic section, headquarters at Boston.

Peterson is Transferred

R. F. Peterson has been transferred from Waukegan factory of the Biflex company, where he was manager, to succeed J. A. Grimm as manager of the local plant. Mr. Grimm has resigned to join L. P. Halladay in establishing a new miscellaneous manufacturing concern.

Newill Leaves Westinghouse

Edward B. Newill, formerly manager of the control engineering department of the Westinghouse Electric and Mfg. Co., has resigned to become affiliated with the General Motors Radio Corp. For the present he will act as assistant to the president of the Delco Products Corp.

Plymouth Names Scott

The appointment of C. W. Scott as manager of the Washington, D. C., district of the Plymouth Motor Corporation has been announced recently by A. Van DerZee, Plymouth general sales manager. Prior to this appointment, Mr. Scott was manager of the Albany, N. Y., district.

Roark Made District Representative

J. F. Roark has been appointed district representative of the Marmon Motor Car Co. in the Texas and Louisiana territory.

Barton Appointed Representative

Charles R. Barton has been appointed metropolitan representative of the Craveroiler Corp. of America, in the New York territory.

Russell Appoints Cortwright

J. A. Cortwright has been appointed assistant division manager of the San Francisco office of the Russell Mfg. Co., Middletown, Conn.

Tilsher Resigns From Wright

George Tilsher, production engineer of the Wright Aeronautical Corp., has resigned to establish his own business.

Company is Formed to Make Light Car

Thompson Motor Corp. Product Will Sell at About \$350

MUSCATINE, IOWA, Nov. 4—The Thompson Motor Corp., organized to manufacture the "Littlemac," an 1100-lb., 80-in. wheelbase car, has been incorporated with \$1,000,000 authorized capital. Its organizers state that production will be under way by April 1, 1930. Production of 30,000 cars is hope for the first year. Three plants, each 700 ft. by 600 ft., are to be built here for production.

The machine, weighing less than half an ordinary light model car, has a tread of 40 in., stands less than six ft. high with a Continental Red Seal motor of 18 hp.; will develop 75 m.p.h. It is expected to sell at between \$300 and \$400. The commercial delivery car, expected to compete with motorcycle delivery machines, has a right-hand drive, but the coupe and roadster have standard left-hand drive.

Herbert G. Thompson, mayor of the city, is president of the company; Joseph W. Valentine, Rock Island, Ill., vice-president; State Senator Ralph U. Thompson, Muscatine, brother of the president, is secretary, and Harry H. Hoban, Rock Island, Ill., treasurer. Clayton E. Frederickson, automotive engineer, who designed the car, is second vice-president.

Insurers Are Seeking Business on Taxicabs

NEW YORK, Nov. 7—Several stock companies which originally rejected the writing of insurance for taxicabs here are now seeking to get some of this business, according to the deputy superintendent of insurance of New York, Samuel D. Macpeak. A hearing was held before deputy superintendent of insurance, Francis Ward, several days ago and the matter is now under consideration.

Some time ago, due to competition of the mutual companies for this business, the New York State insurance department fixed certain quotas so that a company could write only a certain amount of this insurance. The mutual companies are said to have paid dividends last year and to have prospered on this business.

Companies participating in the recent conference included the Capitol City Surety Co., the Consolidated Indemnity Co., the Concord Casualty and Surety Co. and the Greater City Surety and Indemnity Corp.

G. M. to Move a Plant

EAST MOLINE, ILL., Nov. 4—General Motors will transfer the Yellow Sleeve Valve Engine Works plant in this city to Pontiac, Mich., within the next few weeks, it was announced this week by E. A. Taylor, manager of the

Wine Used for Water in French Automobiles

EPERNAY, R. F., Oct. 26—A bountiful harvest of grapes coupled with the excessive scarcity of water in some parts of France has made it a not uncommon sight for stranded motorists to purchase a brimming bucket of wine to refill dry radiators, according to an Associated Press dispatch. Ordinary wine sells in this section for the equivalent of 20 cents a pail. Water is supplied from springs, from which professional water-carriers supply neighboring villages and, particularly during the harvest season, is at much more of a premium than the omnipresent wine.

plant. The move is in conformity with General Motors plan of concentrating its manufacturing units. The Yellow Sleeve Valve was established here six years ago by the Yellow Cab & Mfg. Co.

Three Distributors Get Whippet Michigan Rights

DETROIT, Nov. 4—The handling of the Whippet line of automobiles in Michigan has been assigned to three distributors: The A. D. Geissler Co., of Detroit; D. T. Packer of Saginaw, and the Lusk-Hartung Co., of Grand Rapids. In keeping with the plan of Willys-Overland, whereby the Whippet line, as well as other products of the company, is to be handled nationally through distributors, Willys-Overland, Inc., of Detroit, ceases to function as a factory branch for this product.

Sales of the Willys-Overland Co. east of Chicago are under the supervision of N. A. Beardsley, general sales manager of the eastern division, while merchandising west of Chicago comes under P. C. Gartley, general sales manager of the western division.

New Plant Unit Opens

DETROIT, Nov. 9—The new parts and maintenance service building at the Oldsmobile-Viking factories, Lansing, has just been opened. The building, which contains 169,300 sq. ft. of floor area, houses a large machine shop, a box factory, pyroxylin painting booths, a technical investigation laboratory and a service promotion school, in addition to offices, receiving and shipping rooms and similar business departments.

Czech Works May Combine

PRAGUE, Oct. 28—Negotiations which were broken off during the summer between the Skoda Works and the Ceskomoravska Engineering Co., Prague, with a view to cooperation in the production of automobiles, have been resumed, and extended to include the Brno Small Arms Co., according to the *Central European Observer*. The combined output of the three companies represents the major part of Czechoslovakia's automobile production, it was said.

Insurance for Car Owners is Proposed

Massachusetts Official Certifies
Bill for Next Legislature
Covering Motorists

BOSTON, Nov. 6—An initiative petition for establishment of a Massachusetts state motor vehicle insurance fund has been certified by Attorney General Joseph E. Warner for presentation to the next legislature. The petition was brought by Frank A. Goodwin, chairman of the Boston Finance Commission, and provides for the repeal of the present compulsory personal liability auto insurance law and the substitution thereof of a state fund.

The bill calls for a reduction in the personal liability auto insurance rate in the larger cities in the eastern part of the state. It makes the rates throughout the Commonwealth uniform on the following scale: pleasure passenger cars, \$16; trucks, \$25; buses and taxicabs, \$50, and motorcycles, \$16.

The fund would be supervised, under the plan of Mr. Goodwin, by a board of three members to be appointed by the Governor. It would have the authority to alter classifications or contributions, in other words, premiums.

False statements made in the presentation of claims would be punishable by a minimum fine of \$1,000 or imprisonment for one year. A maximum imprisonment of 2½ years would be provided for persons obtaining compensation under the state fund as the result of false statements.

New Curtiss Hawk Type Uses Prestone Cooling

NEW YORK, Nov. 4—Curtiss Aeroplane and Motor Co. has developed a new pursuit aircraft for Army use with the designation of P-6 Hawk. This ship is a single-place biplane powered by Curtiss Conqueror D-12, 600-hp. engine. This engine utilizes the new Prestone cooling recently developed by the engineering section of the U. S. Army Air Corps.

The plane has a high speed of 181 m.p.h., cruising speed of 145 m.p.h. and stalling speed of 61.3 m.p.h. It can climb at the rate of 2170 ft. per min. and has an absolute ceiling of 24,400 ft. The framework is of chrome-molybdenum steel and landing gear is of the oleo type.

The empty plane weighs 2430 lb., with a gross weight when loaded of 3154 lb. This allows 200 lb. for crew, 320 lb. for gas and oil, 27 lb. for equipment and 167 lb. for armament.

France Cuts Car Tax

PARIS, Oct. 30 (*Special*)—A cut of two per cent on the French State luxury tax as applied to automobiles, thus bringing it down from 12 to 10 per cent of the catalog price, is announced by the Finance Department.

Reports From Field Correspondents Show Sales Trend

(Continued from page 674)

NEW YORK CITY

Retail sales in and around the New York territory continue to be slower than during the previous months and are just about holding their own with the corresponding period of last year. Dealers' stocks of new cars have become exceedingly burdensome with a few exceptions and have led to wide trading, with the result that used car stocks are also accumulating somewhat to the alarm of the dealers. The recent Wall Street debacle has resulted in some cancellations for orders in the higher priced field, and in a larger number of postponements for orders in this field. Ford continues to be the most active seller in his group, other cars in this group witnessing a material accumulation of dealers' stocks.

Sales during the first two weeks of the month totaled 4866 units, as compared with 5046 for the corresponding two weeks of last year, according to Sherlock & Arnold.

CHICAGO

Although new car sales in October continued to show increases over the same month last year, a reduction of approximately 10 per cent was indicated when compared with September. New car stocks, however, have been reduced in about the same proportion. Sales of used cars likewise are in lesser volume and used car stocks are estimated to be from 10 to 15 per cent higher than last month. Ford sales are approximately 40 per cent of the total, Chevrolet about 35.

BOSTON

Figures show that for the first nine months, new car sales in Massachusetts in all price classes were just a little better than for that period a year ago. While the total increase over 1928 was 25,582, Ford was responsible for 24,389, leaving the other 1193 divided among the rest. New car sales in 1928 were 91,624, this year 117,206.

During September, sales began to taper off. While a number of dealers showed an increase for the three-quarter period, September sales were less than a year ago. October is reported as showing a pronounced curve downward in sales. Dealers are beginning to slash used car prices and one distributor is considering a big auction sale.

MILWAUKEE

While there was a further recession in passenger car sales in Milwaukee and Wisconsin in October, the results of the first three quarters of the year represent a sales volume virtually equal to that of the entire year 1928. This has been accomplished to a large extent by the marked increase in Ford business, Chevrolet's aggregate being below last year, while only a very few other makers have improved their position.

The extent to which dealers have been going to clean up new car stocks is indicated by the publication of daily newspaper advertisements offering new cars at liberal discounts. Principal examples are Hudson-Essex and Dodge. Curtailment of production seems to have been ordered in time to ward off the piling up of new car stocks, and with only an average business in November and December, dealers should go into the new year in a fairly favorable position in this respect.

Minimizing the probable effect of the stock market crash, dealers generally be-

lieve they may look for a moderate sales volume in the remainder of the year, although it may fall below the corresponding period of last year, which was rather exceptional in its sales. Used car stocks remain very heavy and the movement into new hands is only fair, despite strenuous efforts at disposition.

CINCINNATI

First three-quarters sales this year were 30 per cent above last year but October is running below September. September sales were 20 per cent under August. Used cars were moving at a better ratio in October. Both new and used stocks slightly above last October. September sales, low-priced cars 84 per cent; medium 15.2, and high-priced .8 per cent; Ford 182 per cent over Chevrolet and 454 over Essex.

ST. LOUIS

Sales of new cars during the first three quarters of the year were about 5 per cent less than during the same period last year. October business was good, marking a good increase over September, a poor month. Stocks of new cars are heavy, but factories are not forcing dealers. High and low-priced models are selling well, middle-priced cars are slow. Ford continues appreciably ahead of Chevrolet and other low-priced models. Used car stocks are light and sales are good. Accessories are selling well, showing an increase over last year for the first three quarters. Dealers anticipate good business generally for the closing quarter.

NEW ORLEANS

Total sales, all makes, approximate 33 per cent over last year's first three quarters. Ford still is leading the field with Chevrolet second. New and used car stocks are normal.

MINNEAPOLIS

Automobile sales are estimated to have been better as a whole than for the three quarters of 1928. Stocks are not piling up and continue the same ratio as heretofore with sales. Low price, medium price and high price cars are selling in the order named. Ford leads, with Chevrolet, Buick, Hupmobile and Nash following in the two largest counties of the state. The used car situation is good and inventories are fairly low. There is no congestion in this market.

KANSAS CITY

New car sales for the last 10 months on a unit basis will exceed the same period a year ago by 15 per cent but the value will be lower due to the predominance of Ford sales and the purchase of new Fords in preference to used cars which has become a heavy drag on dealers. Cars in higher price field show gain with medium price line suffering most.

DENVER

Sales for the three-quarter period ending Sept. 30 are almost even with that of last year in Denver, and not so good throughout the territory due to depressed farming conditions. October was not quite so good as October, 1928. Used car stocks are heavy, and slow to move, with drastic price reductions. Low-priced cars lead heavily. Ford is leading Chevrolet three to one; the next high, five to one. Ford sales are about 53 per cent of total.

DALLAS

New car sales for October were 10 per cent greater than for preceding months and 15 per cent more than in the same month last year. Sales for the first 10 months of 1929 were 40 per cent greater than for the same period last year. Dealer stocks are normal. Ford is outselling Chevrolet 60 per cent. Car stocks are heavy.

OAKLAND

Northern California sales for October were slightly less than for September and about 25 per cent better than October last year. Used car sales in October were poor. Used car stocks are now the highest in history. San Francisco car stocks are nearly 50 per cent higher than ordinarily. Ford sales are double those of Chevrolet and four and one-half times those of Buick, the next competitor.

SEATTLE

New car sales in Seattle for the first three quarters were approximately 40 per cent ahead of the same period last year. New car stocks are keeping pace with sales. Practically 90 per cent of the total sales are in the low-priced group with Ford still holding the same percentage of lead. The used car market is in good shape, although prices are lower than last year.

German Vehicle Census Shows Registration Rise

BERLIN, Oct. 28 (Special)—The official figures of the German census of automotive vehicles held on July 1 of this year have just been issued. There were registered in Germany on the given date 1,214,059 motor vehicles, including motorcycles, tractors and special types. Of this number 433,205 were passenger cars, compared to 351,300 of the previous census. Of trucks, buses and general commercial vehicles there were 143,952 compared to 121,600 of the previous year.

There were 10,593 buses and 25,095 tractors registered, while in the previous year 8596 buses and 19,007 tractors were counted. The number of motorcycles has increased from 438,288 to 608,342. On July 1, every 56th inhabitant of Germany was owner of a motor vehicle, while in the previous year it was every 69th.

Durant Dealer Stocks Are Low

DETROIT, Nov. 4—At the beginning of October the total number of new cars in the hands of distributors, dealers and branches operating under the Durant Motor Co. of Michigan, which embraces all of the United States except the Pacific Coast, was exactly 6402, according to officials of the company. The used car total was 7219.

Legion Announces Aviation Show

NEW YORK, Nov. 6—The Aviators' Post of the American Legion will hold its second annual New York aviation show at Grand Central Palace, Feb. 9 to 15. The 1930 show will occupy four floors instead of three.

Construction Hits New Low for Year

Seasonal Recession and Changes in Automobile Plants Bring Slump

PHILADELPHIA, Nov. 7—Building construction in the automotive industry has continued to drop and plant additions contemplated have reached the lowest level of the year. Although this is partly because of the seasonal recession, reported shut-downs of automobile plants pending plans for new models and 1930 production are strongly reflected.

Equipment and machine tool manufacturers report a general livening of business, however.

Among the construction projects announced this week are:

M. J. Ort, New York architect, plans \$200,000 service and repair garage and has filed plans for \$100,000 repair garage, including equipment.

Dornier Corp. of America, Inc. (General Motors, New York), considering plans for aircraft plant to cost \$100,000.

General Motors Corp. (Detroit), planning \$100,000 sales and service building at Baltimore.

Norma-Hoffmann Bearing Co., Stamford, Conn., has closed bids on \$250,000 manufacturing plant.

Bellows Falls, Vt., Chamber of Commerce, plans \$60,000 airport at North Charlestown, N. H.

New Haven, Conn., Municipal Airport Committee of the City Council has plans for municipal airport with hangars, etc., to cost \$300,000 with equipment.

Hood Rubber Co., Watertown, Mass., has asked bids on a two-story addition to cost about \$45,000 with equipment.

Waddingham Tractor and Equipment Co., Bradford, Pa., has asked bids on a two-story addition 35 ft. by 60 ft. to cost about \$40,000 with equipment.

Consolidated Aircraft Corp., Buffalo, is considering the establishment of a new plant near Hampton Roads or Norfolk, Va., to manufacture flying boats. Chiefly a testing and assembling plant it will cost, with equipment, about \$100,000.

Colonial Motor Coach Corp., Syracuse, has plans for a one-story service and repair garage building to cost \$160,000 with equipment.

Gar Wood, Inc., Algonac, Mich., will build new plant at Marysville, Mich. Plans will be drawn for two one-story buildings 70 ft. by 550 ft., and 70 ft. by 350 ft., to cost with equipment, \$100,000 and to be completed within 90 days.

O. L. Anderson Co., Inc., Detroit, has purchased a site for a new plant, for which plans are being drawn.

City Machine and Tool Co., Cleveland, has purchased a 30-acre tract for a new plant to cost more than \$150,000 with equipment.

Stahli Auto Body Wagon and Spring Co., Cleveland, is considering a one-story addition to cost more than \$40,000 with equipment.

Curtiss Flying Service, Inc., New York, has awarded contract for one and two-story hangars at Richmond Heights airport, near Cleveland, to cost about \$100,000 with equipment.

International Harvester Co., Chicago, has awarded contract for a two-story factory

branch and service building at Sioux City, Iowa, to cost with equipment about \$150,000.

Firestone Tire and Rubber Co., Akron, Ohio, has plans for factory branch, service and distributing plant at Chicago, to cost about \$150,000 with equipment.

Delco Products Co., Dayton, Ohio, has awarded contract for a seven-story plant to cost \$200,000 with equipment.

Middletown, Ohio, city council is considering a municipal airport with hangar, repair shop and other field buildings to cost about \$120,000 with equipment.

Hill Auto Body and Metal Works, Inc., Cincinnati, is contemplating new one-story plant near Lunken Municipal Airport to cost over \$40,000 with equipment.

Clarksville Aviation Corp., Clarksville, Tenn., has plans for a hangar 80 ft. by 100 ft. with repair facilities, to cost about \$50,000 with equipment.

Laredo Truck and Implement Co., Laredo, Tex., plans storage and distributing plant, with repair and service department to cost over \$40,000 with equipment.

Pan-American Aero Corp., San Antonio, Tex., is negotiating with the local chamber of commerce for a site to manufacture airplanes and parts, the plant to cost more than \$65,000 with equipment.

International Flying Service, Inc., Miami, Fla., is planning erection of several hangars at local airport, units to be 100 ft. by 100 ft., and to include repair and service facilities; cost about \$75,000 with equipment.

Southern Air Transport, Inc., will soon begin construction of two hangars, repair shops, oil storage and other field units at Grosvenor Field, near San Antonio, Tex., to cost more than \$100,000 with equipment.

Woods Bros., Inc., Kansas City, Mo., is planning one-story plant at Rosecrans Field, St. Joseph, Mo., for parts manufacture and assembling, to cost about \$55,000 with equipment.

Piston Ring Castings Co., Inc., St. Louis, is arranging for a new plant to manufacture piston rings, to cost about \$80,000 with machinery.

Reliance Truck and Trailer Co., San Francisco, has filed plans for a one-story plant, to cost about \$25,000 with equipment.

Columbia Metal Stamping to Buy New Building

CLEVELAND, Nov. 4—The Columbia Metal Stamping and Die Co., Cleveland manufacturers of parts for automobiles, has agreed to purchase a new \$50,000 manufacturing building, now being built on the Ferguson Industrial Allotment, Cleveland.

The new plant will add about 21,000 sq. ft. of floor space to present facilities, and is expected to have a yearly output of approximately \$1,000,000. Over \$50,000 in new and larger equipment will be installed in the new plant.

Officers of the company recently announced the appointment of H. Temple Barber, for fifteen years company's representative in Detroit, to the office of secretary and sales manager with headquarters at the new plant offices.

Warehouse is Established

MILWAUKEE, Nov. 4—The Cutler-Hammer Mfg. Co. announces the establishment of a warehouse in St. Louis, to serve the territory included in Kansas, Missouri, Oklahoma, Arkansas, Louisiana, Texas, southern Illinois, southern New Mexico, and parts of Tennessee, Kentucky and Louisiana.

Ford German Plant Locates in Cologne

Berlin Factory to be Abandoned in Favor of New Site

BERLIN, Oct. 27 (Special)—The Ford Motor Co., A. G., has decided on the purchase of a factory site in Cologne, it was announced here recently. Previous newspaper reports that the factory would be located in Cologne were characterized as premature, as the final negotiations were only just completed.

A number of towns besides Cologne, including Neuss and Essen, had made favorable offers to the company to attract it to their area, but Cologne was given the preference, as the land is situated within the new Rhin harbor area and has its own wharf at which ocean-going ships with a tonnage between 2000 and 3000 can be moored direct, which, of course, is not only a great convenience but means a great saving in transport costs.

A factory is to be erected forthwith and the Berlin plant will be given up as soon as it is finished, which will be some time next year. Also the administration will be moved from Berlin to Cologne. Only a showroom and distribution center will be maintained at Berlin in the famous thoroughfare Unter den Linden at a prominent corner. The Ford Company intends using more extensively than hitherto German materials as soon as the plant at Cologne gets working.

Ross Gear and Tool Co. to Expand Foreign Sales

LAFAYETTE, IND., Nov. 4—Plans for greater sales activity in European countries have been announced by Edward A. Ross, president of the Ross Gear and Tool Co., following his return from London and Paris. Factory representatives for Germany and France were appointed; R. Schilling of Stuttgart as factory representative for Germany, and Lucien A. Bollack as factory representative for France.

Announcement has also been made of the purchase, by the Ross Gear and Tool Company, of several European patents which, it was felt, might have some bearing on the cam-and-lever principle of steering.

Dodge Boat Contract Let

NEW YORK, Nov. 4—The contract for the erection of the recently announced new plant of the Horace E. Dodge Boat and Plane Corp. has been awarded, it was announced here today. The new plant will occupy 100 acres of the former site of Camp Stuart, directly on Hampton Roads, near Newport News. Construction will be started at once upon the first unit of the plant, which will involve an approximate investment of a million dollars.

Austin Gets Contract for Big Soviet Plant

NEW YORK, Nov. 4—The Amtorg Trading Corp. and the Austin Co. of Cleveland have finally executed a contract for the design and construction by the American company of an automobile plant at Nizhni Novgorod in the Soviet Union, according to a joint announcement made by Saul G. Bron, chairman of the board of directors of the Amtorg Trading Corp., and Wilbert J. Austin, president of the Austin company.

The Nizhni Novgorod plant, which is to produce cars and trucks of the Ford A and AA models, has already had its original schedule stepped up from 100,000 to 120,000 vehicles a year.

Stock Decline Summarized

NEW YORK, Nov. 5—Automotive stocks declined 27.4 per cent in market value during October, according to Frazier Jelke & Co. This compares with a decline of 100 representative stocks in various classifications of 18.7 per cent. The decline in the seven motor stocks chosen for this index amounted to \$1,100,158,000 and was exceeded in the rate of decline by amusement stocks which dropped 34.7 per cent, utilities dropping 30 per cent and electrical equipment, which dropped 29.2 per cent.

Crude Rubber Active

NEW YORK, Nov. 4—Trading in crude rubber was more active last week with prices declining during the week, according to F. R. Henderson Corp. The lower prices are attributed to anticipated heavy shipments from the East during the next few months. Manufacturers exhibited only a slight interest in the market during the week.

Stocks in London increased during the previous week to 46,819 tons, while

Soviet Plant Wants American Artisans

MOSCOW, Nov. 3—The Soviet Government today decided to engage 300 skilled American workers, including technicians and engineers, for work at the Stalin-grad tractor plant, according to an Associated Press dispatch. With the aid of the Americans the government hopes to increase the production of tractors from 10,000 to 25,000 during the next year. A special commission will be sent to the United States soon to purchase several million dollars worth of equipment for the tractor plant.

stocks in Liverpool increased to 12,665 tons. Stocks in the hands of dealers in Colombo, Ceylon, at the end of the third quarter are reported at 5695 tons, practically no change from the previous quarter. Total arrivals at all ports of the United States during October are estimated at 42,950 tons.

Rubber Shipments Drop

NEW YORK, Nov. 5—Shipments of crude rubber from Malaya declined during October to 47,937 tons as compared with 53,484 tons for September, according to cable advices received by the Rubber Exchange. This compares with exports in October, 1928, of 24,441 tons.

Consolidated Adds Branch

NEW YORK, Nov. 4—The Consolidated Instrument Co. of America, Inc., has opened a branch office in Wichita, Kansas. The branch will be in charge of M. E. Hulse, western sales manager of the company, with Prentiss Cleaves, Jr., formerly associated with the Pioneer Instrument Co., in charge of the service department.

Hudson-Essex Distributor Announces Price Cuts

CHICAGO, Nov. 4—Reductions of \$150 to \$500 in the prices of current Hudson-Essex models, to clear stocks in preparation for new models, were announced here yesterday by the Hudson Motor Co., of Ill., in an advertisement appearing in the *Chicago Tribune*. The Hudson standard sedan was quoted at \$1,080, and the Essex coach at \$690 in the advertisement. Savings on these models were advertised as \$240 and \$153 respectively.

New Dodge sedans listing at \$1,070 were advertised for sale at \$795 by the Dashiell Motor Co., in the same issue of the newspaper. No explanation was given for this reduction.

Distributor Cuts Prices

DETROIT, Nov. 4—The Aaron DeRoy Motor Car Co., Hudson-Essex distributor of this city, has announced local reductions in the "delivered prices" ranging from \$245 to \$645 in the Hudson line and from \$150 to \$195 in the Essex line. These reductions, which are only local, are made in anticipation of new models, according to Aaron DeRoy, and are for the purpose of clearing stocks.

Little Giant Business Sold

SPARTA, ILL., Nov. 4—The Little Giant Punch and Shear Co. has disposed of its business to the T. J. Gundlach Machine Co., of Belleville, Ill., according to an announcement made by the former company.

Guggenheim Contest Entries Stop

NEW YORK, Nov. 4—All entries, 14 in number, to the International Safe Aircraft Competition, organized by the Daniel Guggenheim Fund for the Promotion of Aeronautics, have been presented for the competition.

Calendar of Coming Events

SHOWS

Charleston, S. C., Automobile ... Nov. 11-18
New York Automobile Salon ... Dec. 1-7
National Power Show, Grand Central Palace, New York ... Dec. 2-7
Philadelphia, Automobile ... Jan. 11-18
Buffalo, Automobile ... Jan. 11-18
Milwaukee Automobile Show ... Jan. 11-18
Cincinnati, Automobile ... Jan. 12-18
Boston, Automobile ... Jan. 18-25
Detroit, Automobile ... Jan. 18-25
Baltimore, Automobile ... Jan. 18-25
Harrisburg, Automobile ... Jan. 18-25
Louisville, Automobile ... Jan. 18-25
Hartford, Automobile ... Jan. 18-25
Pittsburgh, Pa., Automobile ... Jan. 18-25
Rochester, Automobile ... Jan. 20-25
Columbus, Automobile ... Jan. 26-Feb. 1
Wilkes-Barre, Automobile ... Jan. 27-Feb. 1
San Francisco, Cal., Automobile ... Feb. 1-8
Toledo, Ohio, Automobile ... Feb. 3-8
Wichita, Automobile ... Feb. 3-8
Cumberland, Automobile ... Feb. 3-8
Syracuse, Automobile ... Feb. 3-8
Ottawa, Automobile ... Feb. 3-8
Peoria, Automobile ... Feb. 4-8
St. Louis, Automobile ... Feb. 4-9
Denver, Automobile ... Feb. 10-15
Sheboygan, Automobile ... Feb. 10-16
Mankato, Automobile ... Feb. 12-15
Providence, Automobile ... Feb. 14-22
Camden, N. J., Automobile ... Feb. 24-Mar. 1
Des Moines, Automobile ... Feb. 24-Mar. 1
Seattle, Wash., Automobile ... Feb. 25-Mar. 2
Detroit (All-American Aircraft) ... April 5-13

N.S.P.A. Show and Convention

Detroit ... Nov. 11-16
London, Trucks ... Nov. 7-16
Paris, Trucks ... Nov. 14-24
London, Motorcycles ... Nov. 30-Dec. 7
Brussels Auto Salon ... Dec. 7
New York National ... Jan. 4-11
Newark (N. J.) Automobile Show ... Jan. 11-18
Boston Automobile Show ... Jan. 13-25
Chicago National, Coliseum ... Jan. 25-Feb. 1
Cleveland Automobile Show ... Jan. 25-Feb. 1

CONVENTIONS

Asbestos Brake Lining Assn., New York ... Dec. 11
Ohio Assn. of Commercial Haulers, Cleveland ... Jan. 30-31
World Engineering Congress, Tokio, Japan ... Oct. 29-Nov. 22
National Automotive Parts Association, Detroit ... Nov. 6-8
National Tire Dealers Assn., Chicago ... Nov. 11-14
International Acetylene Assn., Chicago ... Nov. 13-15
National Asso. Finance Companies, Chicago ... Nov. 19-20
American Society Mechanical Engineers, New York ... Dec. 2-6

Highway Research Board, Ninth Annual Meeting, Washington, D. C. ... Dec. 12-13
National Automobile Dealers Association, New York City ... Jan. 6
American Roadbuilders Association, Atlantic City ... Jan. 11-18
American Institute Electrical Engineers, New York ... Jan. 27-31
National Automotive Dealers Association, Chicago ... Jan. 27-28
Southwest Road Show and School, Wichita ... Feb. 25-28
American Society Mechanical Engineers, Fiftieth Anniversary Celebration: New York ... April 5
Hoboken, N. J. ... April 7
Washington, D. C. ... April 8-9

RACES

Los Angeles ... Nov. 17
S. A. E.
Transportation Meeting, Toronto ... Nov. 12-15
Annual Meeting, Detroit ... Jan. 21-24

SALONS

Hotel Drake, Chicago ... Nov. 9-16
Hotel Commodore, New York City ... Dec. 1-7
Hotel Biltmore, Los Angeles ... Feb. 8-15
Palace Hotel, San Francisco ... Feb. 22-Mar. 1